

**Environmental Assessment for
Rehabilitation of Ancheta Galaz Community Ditch
Grant County, New Mexico**

FINAL

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Delivery Order 14**

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Acronyms

BMP	Best Management Practice
CAA	Clean Air Act
CFR	Code of Federal Regulations
Corps	United States Army Corps of Engineers, Albuquerque District
dB	decibel
°F	degrees Fahrenheit
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FHWA	Federal Highway Administration
ITA	Indian Trust Asset
Leq	equivalent sound level
NEPA	National Environmental Policy Act
NMDGF	New Mexico Department of Game and Fish
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OSE	Office of the State Engineer
ppm	parts per million
PM _{2.5}	particulate matter that measures 2.5 microns or less in diameter
PM ₁₀	particulate matter that measures 10 microns or less in diameter
SO ₂	sulfur dioxide
SR	State Route
µg/m ³	micrograms per cubic meter
U.S.	United States
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WRDA	Water Resources Development Act

FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF ACTION

Rehabilitation of the Ancheta Galaz Community Ditch.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Water Resources Development Act of 1986 (P.L. 99-662) authorized the restoration and rehabilitation of irrigation ditch systems and acequias in New Mexico. Due to the importance of acequias to the preservation of cultural and historic values in the state, the U.S. Army Corps of Engineers, Albuquerque District is providing assistance to the Ancheta Galaz Community Ditch to improve the diversion structure for the system. An Environmental Assessment (EA), required to evaluate the impacts of modifying the acequia, will be prepared for the following project.

2.1 Proposed Action

The project area for the Ancheta Galaz Community Ditch is located in Grant County, New Mexico on the Mimbres River just upstream from the bridge on State Route (SR) 152 near the community of San Lorenzo. The Proposed Action would consist of realigning and concrete lining a segment of the irrigation ditch, protecting the adjacent streambanks so they do not erode further, and removing channel fill obstructing flows upstream from the SR 152 bridge. The new concrete-lined ditch is approximately 220 feet long, the east and west bank stabilization structures are approximately 430 feet and 150 feet, respectively, and the river channel berm to be removed is approximately 330 feet in length.

2.2 No Action Alternative

Under this alternative, streambank stabilization and concrete realignment of the ditch would not occur, and ditch failure caused by erosion undercutting from the Mimbres River would eventually result in failure of the ditch. Consequently, landowners would be without irrigation water.

3.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

As required by the National Environmental Policy Act, this EA evaluates the potential environmental impacts associated with the proposed ditch realignment, lining, and streambank protection. The effect findings for each resource area are described below.

Geology, Soils. Geology and soils would not be significantly affected under the Proposed Action alternative. Temporary surface disturbance would result from earthmoving to install the bank stabilization structures and other related construction, but soil erosion would be minimized through the use of Best Management Practices (BMP) during construction. Streambanks would be stabilized with rock-filled wire mattresses and rock, post, and wire structures. Vegetation would be planted after construction is completed. There are prime farmland soils in the project area, but they would not be affected. Localized beneficial impacts to soils would result from implementation of the Proposed Action by minimizing erosion.

Water Resources. There would be no significant impacts from implementation of the Proposed Action. Water is diverted from the Mimbres River into the acequia upstream from the SR 152 bridge. The ditch system discharges its return flows to the river downstream from the SR 152 bridge. During construction there would be low flows in the river and no water flowing in the ditch. This timing and the installation of BMPs during construction would minimize the potential for impacts to water resources.

Section 404 of the Clean Water Act provides for the protection of waters and wetlands of the United States (U.S.) from impacts associated with discharges of dredged or fill material. Certain discharges associated with the construction and maintenance of irrigation ditches are exempt from Section 404

permit requirements (33 Code of Federal Regulations [CFR] 323.4[a], Exemption No. 3). No Section 404 permit is required for the planned action.

Wetlands and Floodplains. There are no wetlands or 100-year floodplains along the ditch, so none would be affected by implementation of the Proposed Action.

Land Use. Ancheta Galaz Community Ditch is used to irrigate 106 acres of hay, pasture, orchards, lawns, and gardens for seven landowners. The construction would stabilize the banks of the Mimbres River and repair the broken section of the ditch and would not negatively affect the land along the ditch. No negative impacts to land use would result from the Proposed Action.

Air Quality. Grant County is monitored for sulfur dioxide and particulate matter. Grant County is in attainment for these pollutants as measured by the U.S. Environmental Protection Agency. While there would be the potential for minor temporary increases in emissions and dust during construction, these increases would not result in non-attainment of air quality standards. There would be no significant impacts to air quality under the Proposed Action.

Biological Resources. There would be no significant impact to vegetation and wildlife, and possibly a slight beneficial impact to aquatic communities due to the implementation of BMPs for the streambank stabilization under the Proposed Action. Native vegetation would be reseeded in some areas along the river once construction is completed.

Threatened and Endangered Species. Determinations have been made that the Proposed Action may effect, but is not likely to affect, the Chiricahua leopard frog, the bald eagle, the Chihuahua chub, and the southwestern willow flycatcher. Species that have a potential for occurring in the project area have been addressed through specific BMPs designed to minimize impacts.

Cultural Resources. No prehistoric or historic archaeological sites were found or are known to occur within or immediately adjacent to this acequia. The Ancheta Galaz Community Ditch is potentially eligible for inclusion on the National Register of Historic Places under Criteria a and d of 36 CFR 60.4. The proposed rehabilitation would have no effect on the form or function of the ditch system. There would be a slight change to the alignment. There would be no adverse effect to historic properties by the proposed rehabilitation project. The Ancheta Galaz Community Ditch has been 100 percent concrete-lined for the past 40 years; therefore, the Proposed Action would not increase the amount of modified ditch.

Indian Trust Assets. The construction or implementation of the proposed project is not anticipated to affect any Indian Trust Assets.

Aesthetics. No adverse effect on aesthetics would result from implementation of the Proposed Action. Exposed soil would be stabilized mechanically or reseeded with native vegetation and could improve the appearance of the area.

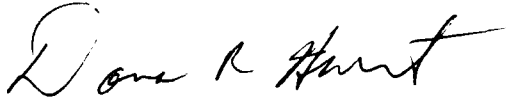
Noise. No significant effects on noise levels would result from the Proposed Action. Noise would increase for the short time that construction equipment is working, but no long-term noise increases would occur.

Socioeconomics. There is the potential for positive impacts on the productivity of the irrigated land if water efficiency and delivery are improved, but these impacts would be slight. The irrigated land is used to grow produce and to feed livestock that could supplement landowners' incomes or ability to trade products, but the impact would be negligible and would be difficult to measure. There would be no negative impacts resulting from the Proposed Action.

Environmental Justice. The area surrounding the Ancheta Galaz Community Ditch has a relatively high percentage of minorities and low-income families who could benefit from the Proposed Action. The Proposed Action alternative would not adversely affect the health or environment of minority or low-income populations.

4.0 CONCLUSION

The planned action has been fully coordinated with the federal and state agencies with jurisdiction over the biological and cultural resources of the project area. As a result of the EA and the coordination with these agencies, I have determined that the planned action of streambank stabilization and the ditch realignment and concrete lining will have no significant impact on the human environment. Therefore, an Environmental Impact Statement will not need to be prepared for this project.



Dana R. Hurst
Lieutenant Colonel, US Army
District Engineer

11 Feb 2003
Date

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1.0 INTRODUCTION

1.1 BACKGROUND

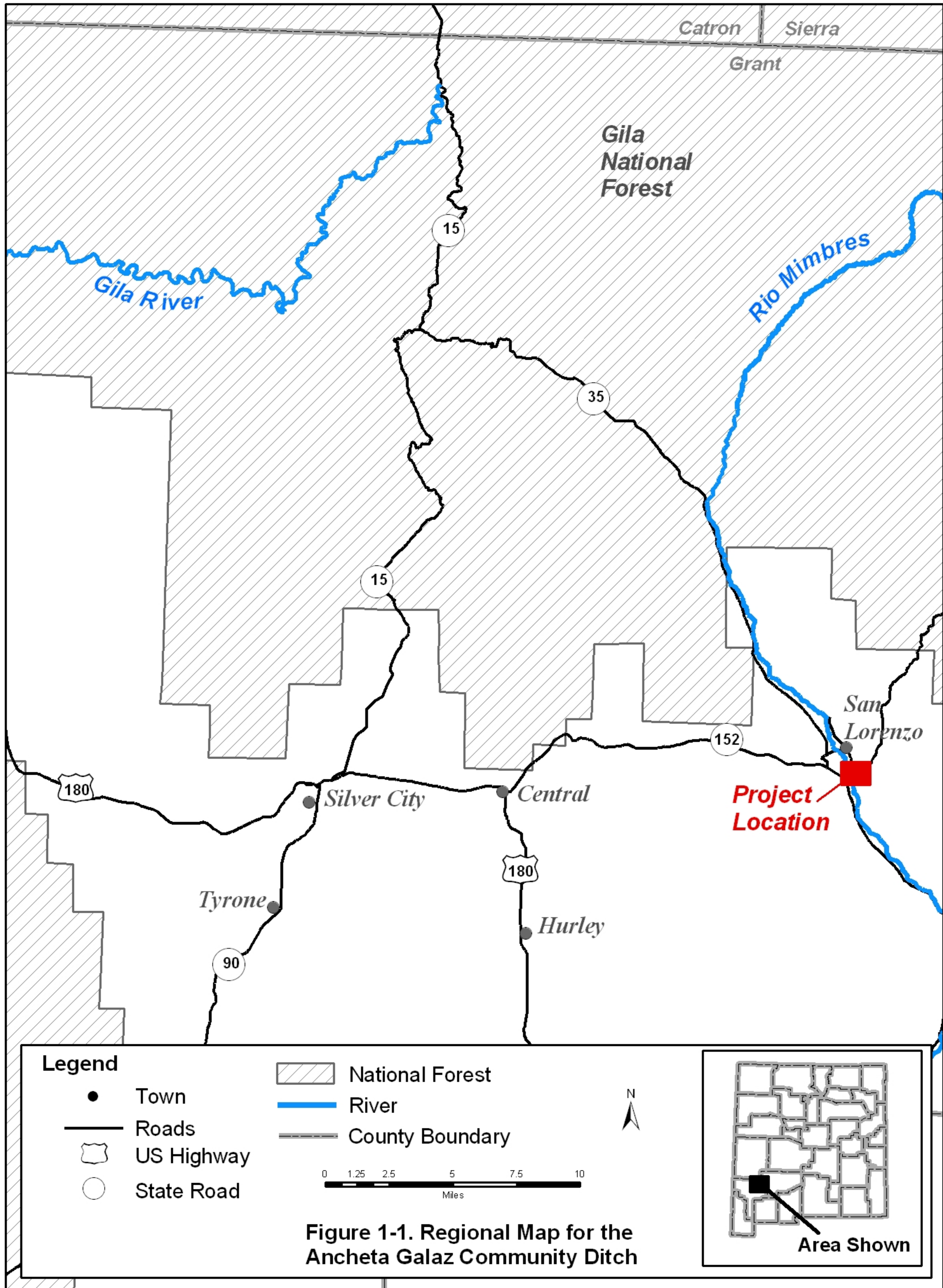
The Ancheta Galaz Community Ditch is located in Grant County, New Mexico on the Mimbres River and crosses under the bridge at State Route (SR) 152 near the community of San Lorenzo (**Figure 1-1**). The irrigation system consists only of the main ditch, which is approximately $\frac{3}{4}$ mile long and flows south, outletting into the Mimbres River downstream from the SR 152 bridge (**Figure 1-2**). The ditch distributes irrigation water to about 106 acres of hay, pastures, gardens, orchards, and lawns for seven landowners (Pittman 2002).

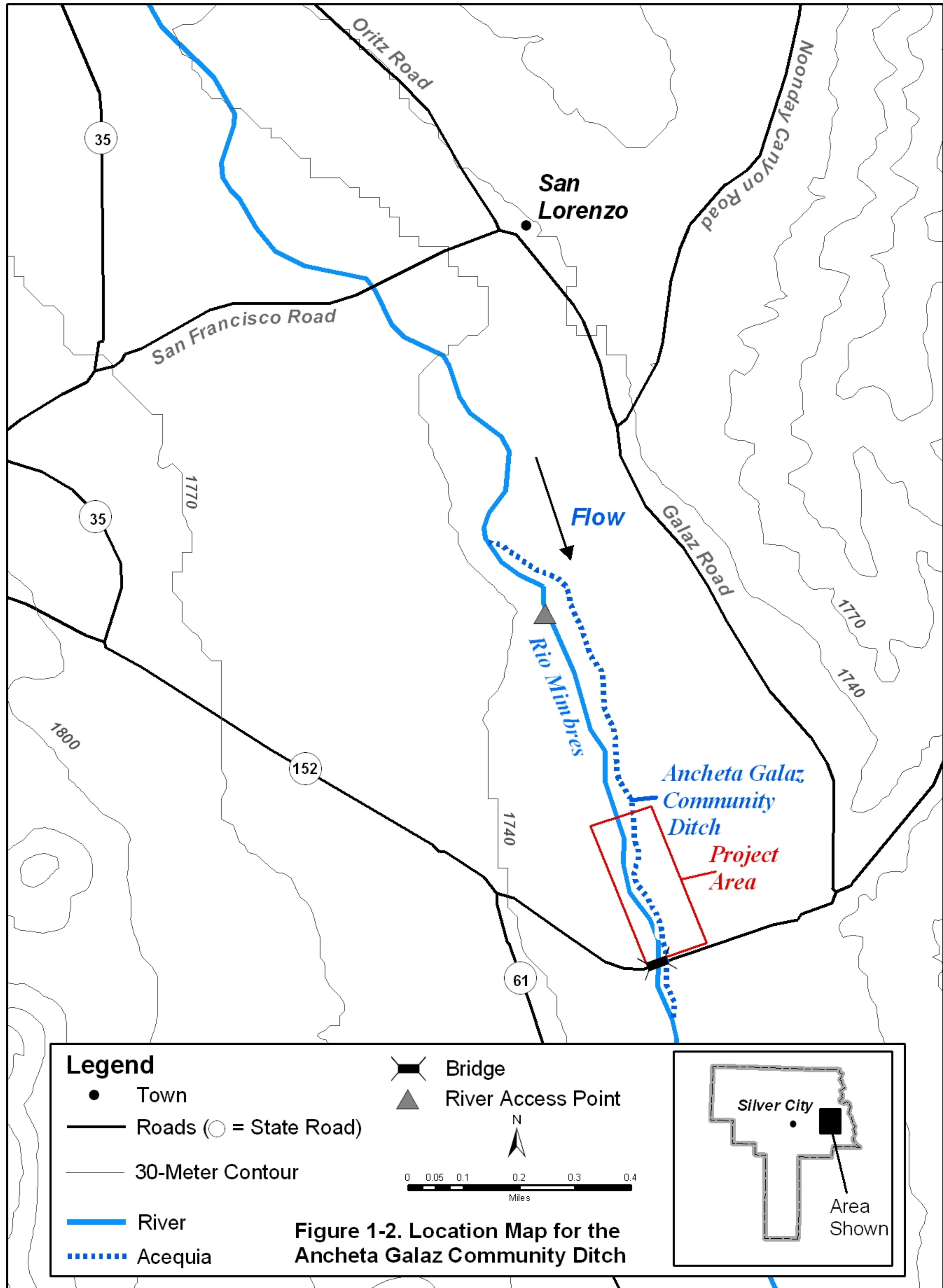
The U.S. Army Corps of Engineers, Albuquerque District (Corps), at the request of the Ancheta Galaz Community Ditch and the New Mexico Office of the State Engineer (OSE), is planning streambank stabilization and concrete ditch realignment under the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662). The WRDA authorized the Corps to conduct the restoration and rehabilitation of irrigation ditch systems and acequias in New Mexico. Under Section 1113 of the Act, Congress has found that New Mexico's acequias date from the eighteenth century and, due to their significance in the settlement and development of the western United States (U.S.), should be restored and preserved for their cultural and historic value to the region. The Secretary of the Army has been authorized and directed to undertake, without regard to economic analysis, such measures as are necessary to protect and restore New Mexico's acequias. The proposed improvements to this acequia satisfy the intent and purpose of this legislation. The non-federal financial responsibility of any work carried out under this section of the Act is 25 percent.

The Corps is providing funding and is therefore the action agency for this project. Project design and inspection is the responsibility of the U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS). The State of New Mexico, through the OSE, is the project sponsor. The Corps has the authority for review and approval of the environmental impacts of the proposed project, as presented in this Environmental Assessment (EA). Under the process for these acequia rehabilitation projects, developed between the Corps and the State under Section 215 of the Flood Control Act of 1968 (P.L. 90-483), as amended, Ancheta Galaz Community Ditch would select a contractor and administer the construction contract. NRCS staff would inspect the project during construction to ensure compliance with all plans and specifications, including those written for environmental protection, and would be responsible for certifying completion of the project according to those plans and specifications before funding would be provided. Upon successful completion of the project, funds would be made available by the Corps to the OSE to pay for rehabilitation of the ditch.

1.2 PURPOSE AND NEED

Approximately 200 feet of the Ancheta Galaz Community Ditch has broken off due to streambank erosion caused by high flows, and has been temporarily replaced with a realigned earthen ditch east of the river. Portions of the remaining existing concrete ditch are located close to the streambank and are in jeopardy of breaking apart and falling into the river due to streambank erosion. High flow conditions on the Mimbres River are likely to destroy additional portions of the ditch and compromise water delivery to downstream irrigators. The proposed streambank stabilization and concrete ditch realignment would deter further erosion and ditch failure.





1.3 REGULATORY COMPLIANCE

This EA was prepared for the Corps, in compliance with all applicable federal statutes, regulations, and Executive Orders (EO) including, but not limited to the following:

- National Environmental Policy Act (NEPA) of 1969, as amended [42 United States Code (USC) 4321 *et seq.*]
- Regulations for Implementing the Procedural Provisions of NEPA [40 Code of Federal Regulations (CFR) 1500-1508]
- Clean Air Act of 1972 [(CAA) (42 USC 7401-7671, as amended)]
- Clean Water Act of 1977 (33 USC 1251 *et seq.*)
- Endangered Species Act (ESA) of 1973 (16 USC 1531-1544, as amended)
- Fish and Wildlife Coordination Act of 1958 (16 USC 661 *et seq.*, as amended)
- Farmland Protection Policy Act, 1981 (7 USC 4201, as amended)
- National Historic Preservation Act of 1966 (16 USC 470)
- Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001-3013)
- American Indian Religious Freedom Act of 1978 (42 USC 1996)
- Archaeological Resources Protection Act of 1979 (16 USC 470)
- Protection of Historic and Cultural Properties (36 CFR 800 *et seq.*)
- EO 11514, Protection and Enhancement of Environment Quality
- EO 11988, Floodplain Management
- EO 11990, Protection of Wetlands
- EO 12898, Environmental Justice
- EO 13007, Indian Sacred Sites
- EO 13084, Consultation and Coordination with Indian Tribal Governments
- EO 11593, Protection and Enhancement of the Cultural Environment

This EA is also in compliance with applicable State of New Mexico regulations and standards.

2.0 DESCRIPTION OF ALTERNATIVES AND PROPOSED ACTION

2.1 ALTERNATIVES

Two alternatives were considered to address the problems of streambank erosion and loss of irrigation water from Ancheta Galaz Community Ditch.

1. No Action Alternative: No rehabilitation work would be performed to address the existing problems.
2. Proposed Action Alternative: Realign and concrete line a segment of the Ancheta Galaz Community Ditch along the east bank of the Mimbres River. Remove a berm from the river channel and install streambank stabilization structures on the east and west banks.

2.1.1 No Action Alternative

Under this alternative, no rehabilitation work would be done. Problems caused by streambank erosion and an unlined ditch would result in the eventual loss of irrigation water delivery or continuing high maintenance.

2.1.2 Proposed Action Alternative

The Proposed Action would consist of realigning and concrete lining the new irrigation ditch, protecting the streambanks from further erosion, and removing the channel fill obstructing flows upstream from the SR 152 bridge. The existing concrete-lined ditch (approximately 246 feet) along the eroded streambank would be removed. The earthen ditch that has been realigned further east and ties into the existing concrete ditch, approximately 100 feet from the riverbank, would be lined with concrete for 255 feet.

Streambank protection would be installed for approximately 430 feet of the east bank of the river and approximately 150 feet along the west bank. The streambank protection along the east bank would consist of a double row of 4-inch (or larger) diameter posts installed at the toe of the streambank slope in the channel, beginning adjacent to the existing wire-bound rock at the bridge. Wire mesh fencing would be strung between the posts and the center would be filled with rock. The streambank protection on the west bank would consist of 1-foot thick wire-bound rock, installed on the bank just upstream from the bridge and excavated at least 3 feet below the channel bottom.

After the streambank protection is installed on the west side of the river, approximately 330 feet of earthen berm in the Mimbres River channel would be removed and used to fill behind the post, wire, and rock structure on the east bank to slope the steep bank.

Prior to any construction, a survey of the area would be conducted by a qualified biologist to determine whether suitable habitat for the threatened Chiricahua leopard frog is present.

Site access to the riverbed would be through private land on the west side of the Mimbres River from SR 152. A staging area would be located on the east side of the Mimbres River and would be accessed through private land from SR 152. After completing the stabilization and realignment construction, the riparian vegetation would be replaced with a mixture of native grasses and willows along the base of the post, wire, rock structure, and native grasses on the slope, as recommended by the NRCS (Garrison 2002). If any trees are removed, each tree would be replaced by 10 saplings along the streambank and protected from damage by wildlife or livestock.

2.2 ENVIRONMENTAL PROTECTION

Rehabilitation of the irrigation system would utilize appropriate Best Management Practices (BMP), installed during and after construction to minimize soil erosion and sedimentation in waterways. Construction would occur during a period of no water flowing in the acequia and low flows in the river. Appropriate BMPs to be installed during construction include rubber-tire construction equipment use in

the riverbed, metal-matting in the riverbed, silt traps and fencing, open channel passage for aquatic organisms, cofferdam (created from the spoil berm in the channel) to keep water away from the west bank while working on bank stabilization, winter construction timing, and proper grading of slopes. Damage to existing vegetation would be avoided as much as possible.

Access to the construction site would be from the SR 152 shoulder, through a driveway on the east side on private land, and/or the west bank river entrance point (Figure 1-2). NRCS staff would coordinate with the Corps to approve needed access routes, borrow sites, staging areas, other high use areas, or any changes to these areas, regardless of their ownership or distance, to ensure that natural and cultural resources would be protected. The Ancheta Galaz Community Ditch Association would be responsible for assuring operation and maintenance of the project after completion.

To protect soils from wind and water erosion after construction, disturbed areas would be stabilized with appropriate native vegetation, according to recommendations made by NRCS. Establishment of native grasses would minimize the spread of weeds in the disturbed soil. The NRCS would monitor the site for 3 years to ensure successful growth in revegetated areas.

All waste material would be disposed of properly at pre-approved or commercial disposal areas or landfills. Fuel, oil, hydraulic fluids, and other similar substances would be appropriately stored away from the ditch and the river, and must have a secondary containment system to prevent spills if the primary storage container leaks.

Prior to construction, all environmental protection measures as expressed by contract clauses, design drawings, or other means would be reviewed with the acequia members and the contractor at a pre-construction conference.

There are no other actions for this acequia known to be planned by other federal, state, county, or municipal agencies.

3.0 EXISTING ENVIRONMENT AND FORESEEABLE EFFECTS OF THE PROPOSED ACTION

3.1 CLIMATE

Average climatic statistics for the project area were determined using the closest weather station at the Mimbres Ranger Station, New Mexico because the Ancheta Galaz Community Ditch is approximately at the same elevation. Average annual maximum temperature for the project area is estimated as 70 degrees Fahrenheit (°F) and the average annual minimum temperature is estimated at 34° F (WRCC 2002). Average annual precipitation in this region is 17.4 inches, occurring as both rain and snow (WRCC 2002). The majority of the rainfall is received from July through October and the majority of the snowfall is received from December through February. Moist air generated from the Gulf of Mexico acts as the source of rainfall in the summer months, while the Pacific Ocean affects climatic patterns for the winter months. The average growing season in the project area is approximately 152 days, from late April to late September (NRCS 1998).

3.2 PHYSIOGRAPHY, GEOLOGY, AND SOILS

The project area is located in the northwestern Mexican Highlands section of the Basin and Range physiographic province. The Gila River and the Continental Divide are major topographic features of this province. Arid, internally drained structural basins, called bolsons, and arroyo valleys are characteristic. Surficial geology consists of an undifferentiated mixture variously aged deposits (Williams 1986).

The primary soil series on the project site is the Manzano series. Soils in this series are deep and well drained, formed in alluvium derived from mixed sources (SCS 1983). The Manzano loam, 0 to 1 percent slopes, map unit, which occurs on the east bank and in the staging area, is suitable for use as pasture, rangeland, and irrigated crops and is prime farmland if irrigated. It has moderately slow permeability, and its water erosion hazard is slight, while it is moderately susceptible to wind erosion.

Riverwash is a miscellaneous soil map unit, located on the west bank of the project area, which is typically found along stream channels. It is composed of a mixture of sand, silt, and gravel that has little or no soil material and supports little vegetation. Although riverwash is used as a source for sand and gravel, it has limited agricultural value. Due to its variable composition, it is not rated for its physical characteristics.

No hydric soils have been identified on the site.

The contractor would use Best Management Practices (BMP) to minimize erosion and sedimentation as described under Environmental Protection in Chapter 2. During construction, these practices would include mulch application, straw/hay bales or silt fence, and proper grading. To protect soils from wind and water erosion after completion of earthmoving, disturbed areas would be seeded with native vegetation determined by site characteristics.

Streambank erosion would be minimized through the stabilization measures under the Proposed Action. Ditch erosion would be eliminated where concrete lining is installed. These measures would result in beneficial impacts to soils under the Proposed Action. Under the No Action alternative, streambank and ditch erosion would continue to occur, resulting in potentially significant impacts to soils in the project area. No impacts to the prime farmland soils would occur under either alternative.

3.3 WATER RESOURCES

The project area is located along the Mimbres River, which is a closed basin. Designated uses of the perennial reaches of the Mimbres River include cold water fishery and irrigation (NMED 2000). These uses are not fully supported due to problems with stream bottom deposits and temperature. These

problems are attributed to the use of the surrounding area as rangeland, as well as hydromodification including streambank modification and removal of riparian vegetation (NMED 2000).

Section 402(p) of the Clean Water Act specifies that stormwater discharge associated with construction activities disturbing 5 or more total acres of land must be authorized by a National Pollutant Discharge Elimination System (NPDES) Permit. NPDES permit authorization is not required in this instance, since less than 5 acres would be disturbed. However, BMPs would be used as necessary to prevent erosion and sedimentation wherever project construction activities occur.

Section 404 of the Clean Water Act provides for the protection of waters and wetlands in the U.S. from impacts associated with discharges of dredged or fill material into waters of the U.S., including wetlands. Discharges associated with the construction and maintenance of irrigation ditches from Section 404 permit requirements is exempt (33 CFR 323.4 [a], Exemption No. 3). In the spring of 2000, the Corps advised the New Mexico Highway and Transportation Department to excavate an old silted-in channel on the west side of the river, and place the excavated material to form an island between the new and old channels to convey water away from the eroding bank until a permanent erosion protection plan could be implemented. This island would be removed under the Proposed Action.

Since the Mimbres River is an isolated water, does not cross state lines, and does not support navigation, the proposed ditch rehabilitation, fill removal, and bank protection can proceed without any Section 404 permits (Malanchuk 2002). No state water quality certification is required under Section 401.

The streambank and ditch erosion would be greatly minimized if the streambank protection and concrete lining would be installed under the Proposed Action. This would positively affect water quality in the Mimbres River. Under the No Action alternative, erosion and sedimentation would continue, negatively affecting the river.

3.4 WETLANDS AND FLOODPLAINS

Wetlands are protected from development under EO 11990 (Protection of Wetlands). Guidance from the EO requires federally funded activities associated with wetlands to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural beneficial values of wetlands.

EO 11988 (Floodplain Management) provides federal guidance for activities within floodplains of inland and coastal waters. Preservation of the natural values of floodplains is of critical importance to the nation and the State of New Mexico. Federal agencies are required to “ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management.” No additional development of the Mimbres River is likely to result from this project. No flood hazard zones (100-year floodplains), as delineated by the Federal Emergency Management Agency, or wetlands are present in the project area. Neither of the alternatives would adversely affect wetlands or floodplains.

3.5 LAND USE

Ancheta Galaz Community Ditch supplies irrigation water to seven irrigators and a total of 106 acres (Montoya 2002). Private lands irrigated from the acequia are cultivated for hay, orchards, private gardens, lawns, and small pastures.

Under the No Action alternative, the Mimbres River would continue to undercut the existing irrigation ditch threatening further destruction of the ditch. This would result in loss of irrigation water possibly causing the irrigated land to change from cropland to fallow or non-agricultural uses over time. Under the Proposed Action alternative, water delivery would be more reliable and the riverbank stabilization would allow for the continued productivity of the irrigated land.

3.6 AIR QUALITY

The project area is in attainment with National Ambient Air Quality Standards set by the U.S. Environmental Protection Agency (USEPA). The New Mexico Environment Department, Air Quality Bureau monitors ambient air quality throughout New Mexico under the CAA and has permanent sites relatively close to the Ancheta Galaz Community Ditch in Grant County. Two out the six criteria pollutants, sulfur dioxide (SO₂) and particulate matter (PM₁₀, and PM_{2.5}), are monitored in Silver City because they are identified as problematic pollutants in these areas. None of these measured averages exceed the national standards (Table 3-1).

Table 3-1. Ambient Air Quality for the Monitoring Stations in Grant County, New Mexico

<i>Site Name</i>	<i>Site Number</i>	<i>Pollutant Monitored</i>	<i>USEPA National Standard Maximum</i>	<i>2000 High Values Average</i>
Grant	35-017-1003-1	SO ₂	0.145 ppm (24-hour average)	0.012 ppm (24-hour average)
Grant	35-017-0009-1	PM ₁₀	150 µg/m ³ (24-hour average)	27.3 µg/m ³ (24-hour average)
Grant Silver City	35-017-1002-1	PM ₁₀	150 µg/m ³ (24-hour average)	35.3 µg/m ³ (24-hour average)
Grant Silver City	35-017-1002-1	PM _{2.5}	65 µg/m ³ (24-hour average)	10.7 µg/m ³ (24-hour average)

Source: Ball 2002.

Notes: ppm = parts per million.

PM_{2.5} = particulate matter that measures 2.5 microns or less in diameter.

PM₁₀ = particulate matter that measures 10 microns or less in diameter.

SO₂ = sulfur dioxide.

µg/m³ = micrograms per cubic meter.

Increased dust and emissions from earthmoving and construction equipment would potentially contribute to temporary increases in particulate matter. Through BMPs, increased dust would be kept to a minimum, so the Proposed Action alternative would not produce significant impacts to air quality. No construction would occur under the No Action alternative, so no effect on air quality would result.

3.7 BIOLOGICAL RESOURCES

3.7.1 Terrestrial Communities

According to Dick-Peddie (1993), the project area is characterized as Desert Grassland (ecotone). The native vegetative community includes western wheat grass (*Agropyron smithii*), Indian ricegrass (*Oryzopsis hymenoides*), blue and black grama (*Bouteloua gracilis* and *B. eriopoda*, respectively), sedges (*Carex* spp.), junipers (*Juniperus* spp.), and oaks (*Quercus* spp.). The native riparian vegetation community along the Mimbres River includes sedges (*Carex* spp.), grasses (dropseed [*Sporobolus* spp.] and saltgrass [*Distichlis* spp]), narrowleaf cottonwood (*Populus angustifolia*), bigtooth maple (*Acer grandidentatum*), aspen (*Populus* spp.), willow (*Salix* spp.), and alder (*Alnus* spp.) (Dick-Peddie 1993).

Predominant vegetation found within the project area during an August 7, 2002, pedestrian field survey include globemallow (*Sphaeralcea angustifolia*), sunflowers (*Geraea* spp.) and other aster species, milkweed species (*Asclepias* spp), Russian thistle (*Salsola kali*), muhly grass (*Muhlenbergia* spp.), and burrowgrass (*Scleropogon brevifolius*). Willow species, cottonwoods, Chinese elm (*Ulmus pumila*), and sedges were found along the riparian area.

Common animals likely to occur in the proximity of the project area include, but are not limited to, mule deer (*Odocoileus hemionus*), coyotes (*Canis latrans*), squirrels (*Sciurus spp.*), woodrats (*Neotoma spp.*), horned lizard species (*Phrynosoma spp.*), northern flickers (*Colaptes auratus*), woodpeckers (*Picoides spp.*), American robin (*Turdus migratorius*), morning dove (*Zenaida macroura*), barn swallow (*Hirundo rustica*), black phoebe (*Sayornis nigricans*), and American goldfinch (*Carduelis tristis*) (Bailey 1995).

The bank stabilization would take place during the low flow period for the Mimbres River, in the winter of 2002-2003. Construction would pose an insignificant threat to the terrestrial communities due to the localized area of impact and the implementation of BMPs. Construction work for Ancheta Galaz Community Ditch would be limited to bank stabilization immediately upstream from the SR 152 bridge on the west and east banks (approximately 150 feet and approximately 400 feet, respectively) and concrete lining of the ditch on the east bank. Disturbed and backfilled ground would be reseeded and planted with native vegetation, as described in Section 2.1.2. Neither alternative would have a significant impact on the terrestrial flora and fauna.

3.7.2 Aquatic Communities

The Mimbres River, the source of water for the Ancheta Galaz Community Ditch, receives the return water from the ditch approximately $\frac{3}{4}$ mile downstream from the diversion just before the SR 152 bridge. The river is classified as a coldwater fishery (NMED 2000) supporting fishes such as trout (*Salvelinus spp.*). Dietary needs of the trout would indicate the presence of a micro/macrobenthos (NMDGF 2002) in the Mimbres River. During the August 7, 2002, field survey, fry were observed at the dam upstream from the project area. Construction of the bank stabilization and ditch realignment would occur during a period of low flows in the river, minimizing stress to the aquatic community. The construction would reduce bank cutting and provide a stable ditch alignment for the community ditch. BMPs would be implemented as another source of reducing aquatic community impacts. Under the Proposed Action, there would be a slight decrease in the sediment load of the river, which may have a beneficial impact on aquatic communities. The No Action alternative would continue the current situation, without significant impact to aquatic communities.

3.8 THREATENED AND ENDANGERED SPECIES

Conservation of threatened and endangered flora and fauna are primarily managed by the U.S. Fish and Wildlife Service (USFWS) under the ESA, the New Mexico Department of Game and Fish (NMDGF) under the Wildlife Conservation Act of 1974, and the New Mexico Energy, Minerals, and Natural Resources Department under the New Mexico Endangered Plant Species Act and Rule No. NMFRCD 91-1. Under the managing authorities, each agency maintains species lists for selected animals and plants deemed to be threatened and/or endangered. The federal and state protected species of Grant County, New Mexico are listed in **Table 3-2**.

Specialized habitat requirements such as vegetation type and cover, elevation, and geographic location for the species listed in Table 3-2 comprise the preferred habitat regimes for these flora and fauna (NMDGF 2001). Four of the 47 species listed in Table 3-2 are likely to occur in the project area and are discussed in detail below. The remaining 43 species are unlikely to occur due to the lack of suitable habitat, and therefore would not be affected by the implementation of the Proposed Action or the No Action alternatives.

A list of the federally listed threatened and endangered species for Grant County was obtained (USFWS 2002a). Four listed species are likely to occur in the project area: bald eagle, Chiricahua leopard frog, Chihuahuan chub, and southwestern willow flycatcher.

Table 3-2. Federal and State Protected Species in Grant County, New Mexico

<i>Species</i>	<i>Federal Status¹ (USFWS)</i>	<i>State Status¹</i>
Gila Trout (<i>Oncorhynchus gilae</i>)	E	T
Gila Chub (<i>Gila intermedia</i>)	CW	E
Chihuahua Chub (<i>Gila nigrescens</i>)	T	E
Roundtail Chub (<i>Gila robusta</i>)	-	E
Spikeadace (<i>Meda fulgida</i>)	T	T
Loach Minnow (<i>Rhinichthys cobitis</i>)	T	T
Gila Topminnow (<i>Poeciliopsis occidentalis occidentalis</i>)	E	T
Chiricahua Leopard Frog (<i>Rana chiricahuensis</i>)	T	-
Lowland Leopard Frog (<i>Rana yavapaiensis</i>)	-	E
Reticulate Gila Monster (<i>Heloderma suspectum suspectum</i>)	-	E
Mexican Garter Snake (<i>Thamnophis eques megalops</i>)	-	E
Narrowhead Garter Snake (<i>Thamnophis rufipunctatus rufipunctatus</i>)	-	T
Brown Pelican (<i>Pelecanus occidentalis carolinenses</i>)	E	E
Neotropic Cormorant (<i>Phalacrocorax brasilianus</i>)	-	T
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	T	T
Common Black-hawk (<i>Buteogallus anthracinus anthracinus</i>)	-	T
Aplomado Falcon (<i>Falco femoralis septentrionalis</i>)	E	E
American Peregrine Falcon (<i>Falco pergrinus anatum</i>)	-	T
Common Ground-Dove (<i>Columbina passerina pallescens</i>)	-	E
Yellow-Billed Cuckoo (<i>Coccyzus americanus occidentalis</i>)	CW	-
Mexican Spotted Owl (<i>Strix occidentalis lucida</i>)	T	-
Broad-Billed Hummingbird (<i>Cynanthus latirostris magicus</i>)	-	T
White-Eared Hummingbird (<i>Hylocharis leucotis borealis</i>)	-	T
Lucifer Hummingbird (<i>Calothorax lucifer</i>)	-	T
Costa's Hummingbird (<i>Calypste costae</i>)	-	T
Elegant Trogon (<i>Trogon elegans canescens</i>)	-	E
Gila Woodpecker (<i>Melanerpes uropygialis uropygialis</i>)	-	T
Southwestern Willow Flycatcher (<i>Empidonax traillii extinus</i>)	E	E
Bell's Vireo (<i>Vireo bellii</i>)	-	T
Gray Vireo (<i>Vireo vicinios</i>)	-	T

<i>Species</i>	<i>Federal Status¹ (USFWS)</i>	<i>State Status¹</i>
Albert's Towhee (<i>Pipilo aberti aberti</i>)	-	T
Baird's Sparrow (<i>Ammodramus bairdii</i>)	-	T
Yellow-Eyed Junco (<i>Junco phaeonotus palliates</i>)	-	T
Varied Bunting (<i>Passerina versicolor</i>)	-	T
Spotted Bat (<i>Euderma maculatum</i>)	-	T
Black-Footed Ferret (<i>Mustela nigripes</i>)	E	E
Mexican Gray Wolf (<i>Canis lupus baileyi</i>)	E	E
Desert Bighorn Sheep (<i>Ovis Canadensis mexicana</i>)	-	E
Gila Pyrg Snail (<i>Pyrgulopsis gilae</i>)	CW	T
New Mexico Hotspring Pyrg Snail (<i>Pyrgulopsis thermalis</i>)	CW	T
Marguire's Beardtongue (<i>Penstemon linarioides ssp. maguirei</i>)	-	E
Night-Blooming Cereus (<i>Peniocereus greggii var. greggii</i>)	-	E
Piños Altos Flame Flower (<i>Phemeranthus humilis</i>)	-	E
Parish's Alkali Grass (<i>Puccinellia parishii</i>)	-	E
Gila Brickellbush (<i>Brickellia chenopodina</i>)	-	E
Slender Spiderflower (<i>Cleome multicaulis</i>)	-	E
Orcutt Pincushion Cactus (<i>Escobaria orcuttii</i>)	-	E

Source: NMDGF 2002, NMRPTC 2001.

Notes: (1) E = Endangered, T = Threatened, PT = Proposed Threatened, CW = Candidate Warranted but precluded.

3.8.1 Bald Eagle (*Haliaeetus leucocephalus*)

In 1978, in response to lowering population and reproductive success, the USFWS (1978) listed the bald eagle throughout the lower 48 states as endangered except in Michigan, Minnesota, Wisconsin, Washington, and Oregon, where it was designated as threatened. The bald eagle was proposed for removal from the list of endangered and threatened wildlife in the lower 48 states in 1999 (USFWS 1999).

Nesting pairs have not been documented in the project area. Bald eagles are not frequently sighted along the Mimbres River, but may occur as occasional visitors during the winter months when construction is scheduled (USFWS 2001).

During construction, if a bald eagle is spotted within 0.5 mile upstream or downstream of the active project site in the morning before project activity starts, or following breaks in project activity, the contractor would be required to suspend all activity until the bird leaves of its own volition. However, if a bald eagle arrives during construction activities or if an eagle is beyond 0.5 mile from the site, construction would not be interrupted. The Proposed Action may affect but is not likely to adversely affect the bald eagle.

3.8.2 Chiricahua Leopard Frog (*Rana chiricahuensis*)

The Chiricahua leopard frog was listed as threatened by the USFWS with a special rule on June 13, 2002 (USFWS 2002b). The Chiricahua leopard frog is now absent from more than 75 percent of its historical localities in Arizona and New Mexico. In 2001, several Chiricahua leopard frogs in different life history stages were noted in the Mimbres River downstream from the project site. This site was an experimental reintroduction site on The Nature Conservancy property. The species' potential habitat would include all historic localities and most permanent or nearly permanent aquatic sites within its range.

The Chiricahua leopard frog is found in a variety of aquatic habitats including thermal springs and seeps, stock tanks, wells, intermittent rocky creeks, and mainstream river reaches. During the day they usually rest hidden among the vegetation surrounding their aquatic habitat and are quick to enter the water when approached. Nocturnal activity may take them farther from the bank, or they may be observed on exposed mats of algae or other floating aquatic vegetation (Degenhardt et al. 1996).

The frog has a distinctive pattern on the rear of the thigh consisting of small, raised, cream colored spots or tubercles on a dark background; relatively rough skin on the back and sides; and often green coloration on the head and back. The species has a distinctive call consisting of a relatively long snore of 1 to 2 seconds in duration.

Threats to this species include predation by non-native organisms (e.g. bullfrogs, crayfish), disease, degradation and destruction of habitat, and water diversions.

Construction of the proposed project would not begin until early winter. Sediment released into the system would be reduced substantially because flows are low during this period. No reproductive efforts occur during these periods; therefore, no young life stages with limited mobility would likely be affected. Before the project begins, a survey for the frog would be conducted as described in Section 2.1.2.

BMPs in place during and after construction would help reduce further degradation of habitat and water quality downstream from the project area. The contractor would be required to use appropriate BMPs to minimize and contain the discharge of suspended sediments into the Rio Grande. These include but are not limited to the following:

1. Metal matting would be laid in the streambed to reduce sediment discharge into the stream;
2. Silt fencing or traps would be installed until all excavation is completed;
3. Construction vehicles would use rubber tires to reduce compaction and loosening of sediment; and
4. An open channel for would be maintained for frog passage around the construction site at all times.

The Proposed Action may affect but is not likely to adversely affect the Chiricahua leopard frog with the implementation of the measures noted above.

3.8.3 Chihuahua Chub (*Gila nigrescens*)

The Chihuahua chub was listed as Threatened by the USFWS without designation of critical habitat on October 11, 1983 (48 *Federal Register* 46053). The Chihuahua chub is restricted to the closed Guzman Basin of southwestern New Mexico and northwestern Chihuahua, Mexico. The species is now confined mainly to its key habitat, a reach of about 4.6 miles of the Mimbres River (Grant County), between Allie Canyon southward and a point 1.5 miles downstream of the Town of Mimbres Post Office (USFWS 2001). Chihuahua chubs have not been found near San Lorenzo but have been collected approximately 5 miles downstream at the Town of San Juan (Coleman 2002).

The Chihuahua chub is almost always associated with in-stream cover, such as uprooted trees and deep pools with adjacent rapid velocity flows. The Chihuahua chub prefers deep vegetated pools and undercut banks in the Mimbres River. Chihuahua chub habitat has been destroyed due to channelization of much of the permanently watered reaches and seasonal desiccation (Propst 1999). There are very little stream cover, deep pools, or rapid flows within the project area.

Construction of the proposed project would not begin until the early winter. Sediment released into the system would be reduced substantially because flows are low during this period. No reproductive efforts occur during these periods; therefore, no young life stages with limited mobility would likely be affected.

BMPs in place during and after construction would help reduce further degradation of habitat and water quality downstream of the project area. The contractor would be required to use appropriate BMPs to minimize and contain the discharge of suspended sediments into the Rio Grande. These include but are not limited to the following:

1. Metal matting would be laid in the streambed to reduce sediment discharge into the stream;
2. Silt fencing or traps would be installed until all excavation is completed;
3. Construction vehicles would use rubber tires to reduce compaction and loosening of sediment; and
4. An open channel would be maintained for fish passage around the construction site at all times.

The Proposed Action may affect but is not likely to adversely affect the Chihuahua chub with the appropriate implementation of the measures noted above.

3.8.4 Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher was listed as endangered on February 27, 1995 (60 *Federal Register* 10694) and critical habitat was designated on July 22, 1997 (USFWS 1997). No critical habitat has been designated for the southwestern willow flycatcher in the Rio Grande Basin.

Southwestern willow flycatchers breed in dense riparian habitats along rivers, streams, or other wetlands. Vegetation can be dominated by dense growth of willows, seepwillows, or other shrubs. Almost all southwestern willow flycatcher breeding habitats are within close proximity (less than 20 yards) of water or saturated soil.

As of the 1999 breeding season, the approximate confirmed numbers of flycatchers included just over 900 territories. In New Mexico, the species has been observed in the Rio Grande, Rio Chama, and the Zuni, San Francisco, and Gila River drainages.

Habitat for the southwestern willow flycatcher does not occur in the project area. Surveys have not detected the flycatcher along the Mimbres River (USFWS 2001). The Proposed Action would have no effect on the southwestern willow flycatcher.

3.9 CULTURAL RESOURCES

3.9.1 Culture History

The Ancheta Galaz project area is situated in what archaeologists have defined as the heartland of the Mimbres Culture Area. Located in the watershed of the Mimbres River, this region is distinguished by a succession of occupations typified, during later prehistoric times, by the appearance of Classic Mimbres black-on-white pottery. This pottery, with its fine linework and zoomorphic figures, is known throughout the world. What follows is a brief summary of the prehistory and history of this region.

Historical documents indicate that Apache Indians inhabited the project area shortly after the Mimbres culture seems to have disappeared. However, there is little or no evidence of the protohistoric nature of the Apaches based on linguistic affiliations with other Uto-Aztecan languages. Apachean speakers seem

to have originated somewhere in the upper Great Plains. Pressured from the east by expanding American colonies, these groups were gradually displaced further south and west across the Great Plains. Athabaskan speaking groups, which includes Apaches, arrived in eastern New Mexico sometime around 1541 (Schroeder 1974a). This progressive displacement continued throughout the 1500s and early 1600s resulting in the appearance of Apache-speaking tribes in southwestern New Mexico no later than the early 1600s.

In the 1750s, the two primary groups inhabiting the project area were the Mimbres Apaches and the Gila Apaches. These groups were so named because of their close association with the headwaters of their respective river valleys. Despite the fact the Spanish gave them different names, these Apachean bands shared a number of common characteristics. The successive displacements noted above no doubt had dramatic impacts on the overall character of Gileño and Mimbrenño bands by the time of initial Spanish contact. They were largely mobile, especially after obtaining horses from the Spanish, and rarely occupied permanent camps. Instead, they occupied *rancherías* whose location shifted from one season to another, and from year to year. All groups relied primarily on hunting-and-gathering, although there is some evidence of limited use of domesticated crops (corn, chili, and pumpkins). The Apache also maintained trade networks with the Pueblo Indians on the Rio Grande, the Mescalero on the east side of the Rio Grande, and the Navajo and Zuni Indians on the north. Among the most important items obtained through trade were buffalo skins and brightly-colored blankets (Schroeder 1974b).

The late 1700s saw a series of military campaigns throughout southern New Mexico as far north as the Gila River. The impact of these campaigns was minimal, at least in terms of numbers of Apaches captured and killed. Yet, by 1790, many Apache bands began to return to Spanish villages in Sonora and Chihuahua (Griffen 1988a). This relatively peaceful period was not without difficulties. Some Apache tribes resisted removal to Spanish presidios and maintained *rancherías* throughout the Mimbres, Mogollon, and Florida mountains (Griffen 1988b). The Spanish policy, somewhat innovative for its time, bought a short peace that came to an end in the 1820s. With the outbreak of the Mexican Revolution and for years thereafter, subsidies for Apaches were seldom, if ever, delivered. Lacking any motivation to abide by their agreement, the Apaches again reverted to their old practice of raiding Spanish settlements. This situation was exacerbated after Independence since several Spanish garrisons along the northern frontier were abandoned. Without replacement troops from the newly-founded Mexican government, the stabilizing influence of the presidios simply dissipated, thereby opening the region once again to Apache raiding (Schroeder 1974b).

The American Period begins with the acquisition of land described in the Treaty of Guadalupe Hidalgo (1848) and with the Gadsden Purchase (1854). These two events formally brought the project area under American jurisdiction. With the arrival of American military forces, Manifest Destiny finally reached the northern frontier of Mexico. The Office of Indian Affairs, operating with the Department of War, was established to help resolve conflicts between settlers and American Indians (Couchman 1990). Consistent with the previous Spanish and Mexican experiences, it rapidly became clear that these newly acquired lands would never be developed without peace from the Apaches. The first territorial governor, James S. Calhoun, served as General Indian Agent from 1848 to 1851 and clearly anticipated the potential for long term warfare throughout the region if the Indians were not placed on reservations (Bancroft 1889).

Although mining began in the early 1800s at Santa Rita del Cobre, the expansion of mining across the region languished until 1891 due simply to transportation difficulties. It was almost impossible to get equipment and supplies into the region and equally difficult to get ore out. Local smelters, most constructed of adobe, were used to process ores until completion of the Silver City, Deming, and Pacific Railroad in 1883 (Entwhistle 1944, Howard 1967). This railroad, which operated between 1884-1899, allowed transshipment of machinery for large smelters so that, by 1904, two high-capacity smelters operated in Silver City (Anderson 1957, Entwhistle 1938, Howard 1967). Similarly, completion of the Atchison, Topeka, & Santa Fe Railroad into Silver City in 1891 also contributed to an expansion of mining throughout Grant County (Lindgren et al. 1910).

Irrigation in the Mimbres River basin began with the efforts of Dr. Michael Steck, New Mexico Indian Agent, to establish a reservation for the Mimbrenño and Gileño Apaches near San Lorenzo in 1851 (Ackerly 1997). Political intrigue, combined with minimal farming success, caused the endeavor to be abandoned in 1853. Irrigation systems eventually appeared throughout the valley in the years immediately following the Civil War.

The Ancheta Galaz Community Ditch was constructed in 1870, largely to relieve competing demands for water from farmers located on the earlier (1869) San Lorenzo East acequia (Berry and Berry 1984). Early cultivation focused on wheat, corn, beans, and vegetables (Berry and Berry 1984). Much of this food was sold to miners at the then-burgeoning mining town of Piños Altos, as well as to the early residents of Silver City. This crop production pattern persisted into the early 1930s, only to be replaced largely by alfalfa production by the 1970s (Ackerly et al. 1993).

Systematic comparisons of a series of hydrographic surveys completed by the OSE, as well as conversations with Mr. Robert Pittman (2002), president of the Ancheta Galaz Community Ditch, indicate that the ditch system has been successively remodeled many times over the past 132 years (OSE 1932, 1970). The locations of diversion dams have shifted over time, largely in response to episodes of flood-induced channel change, and portions of the Ancheta Galaz Community Ditch alignment have been altered over the years (Ackerly et al. 1993). Only within the past 50 years, with the use of concrete lining, has the ditch achieved a degree of stability. The Ancheta Galaz Community Ditch is potentially eligible for inclusion on the National Register of Historic Places under Criteria a and d of 36 CFR 60.4.

3.9.2 Methodology and Survey Results

The cultural resources survey of this proposed replacement portion of the acequia was preceded by a check of site files at the Archaeological Records Management Section in Santa Fe. Five previously recorded sites, including LA5799, LA5800, LA19041, LA65895, and LA73963 are situated in the vicinity of the project area.

Four sites represent prehistoric occupations ranging in age from A.D. 1000 to A.D. 1400. One site contains remains consistent with occupations dating between A.D. 200 to A.D. 1400. All these prehistoric sites show evidence of protracted occupations. LA65895 and LA73963 are related to historic occupations of the Mimbres Valley, dating from the late nineteenth through the mid-twentieth centuries. The Ancheta Galaz Community Ditch does not intersect any of these known sites.

The Class III inventory consisted of an intensive pedestrian survey of the construction and staging areas (4.55 acres) for proposed repairs to the Ancheta Galaz Community Ditch, as well as an examination of the eroded bank where proposed stabilization control structures would be constructed. Additional documentation of the acequia included walking the ditch and recording the locations of water control structures (e.g., culverts, check structures, taps), as well as an on-the-ground inspection of the Ancheta Galaz Community Ditch as it extends downstream from the diversion dam.

No prehistoric or historic archaeological sites were found within or immediately adjacent to the Ancheta Galaz Community Ditch right-of-way. Further, examination of the eroded bank of the Mimbres River in the area proposed for bank stabilization did not reveal any evidence of subsurface archaeological resources. There was no surface evidence of archaeological remains in the proposed staging area situated east of the acequia alignment and north of the SR 152 bridge. None of the five previously recorded archaeological sites discussed above would be affected by the proposed project. Neither the Proposed Action nor the No Action alternatives would have an adverse effect on the irrigation ditch's eligibility as a historic property or on other known cultural resources in the vicinity.

3.10 INDIAN TRUST ASSETS

Indian Trust Assets (ITA) are legal interests in property held in trust by the U.S. for Indian tribes or individuals. Examples of trust assets include land, minerals, hunting and fishing rights, and water rights. The U.S. has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or individuals by treaties, statutes, executive orders, and rights further interpreted by the courts. This trust responsibility requires that all federal agencies take all actions reasonably necessary to protect such trust assets.

Implementation of the Proposed Action or No Action alternatives would not be anticipated to affect any ITAs.

3.11 AESTHETICS

The effects of the riverbank stabilization and ditch realignment on the aesthetics of the valley would be minimal. Exposed soil would be re-seeded and stabilized. Neglecting to rehabilitate the riverbank and realign the Ancheta Galaz Community Ditch would result in continuing the destabilization of the riverbank and erosion that could disrupt the river downstream with sedimentation. If the bank is not stabilized, irrigation water may not be available for crops, resulting in a change to fallow land from irrigated land. The No Action alternative could result in land use changes that would negatively affect the character of the area. The Proposed Action would enable land to continue to be farmed, maintaining the aesthetics of the surrounding landscapes.

3.12 NOISE

Current noise levels are typical for rural areas close to highways. Earthmoving equipment and trucks generally put out decibel (dB) levels 15 to 30 units higher (LHH 2001) than the prescribed Federal Highway Administration (FHWA) recommended levels for residential areas close to highways. Recommended levels of 67 dB are measured in Leq, the constant average sound level, which contains the same amount of sound energy as the varying levels of the traffic noise (FHWA 1999). Construction during the riverbank stabilization would temporarily elevate noise levels, but would not persist. Neither alternative would significantly affect noise levels.

3.13 SOCIOECONOMIC

The proposed project is located near San Lorenzo in Grant County, New Mexico. The closest population center for which demographic characteristics have been collected is Silver City, which is approximately 24 miles to the west, and the county seat. In 2000, Silver City had a population of 10,545, down from 10,683 in 1990 (a decrease of less than 1 percent), while Grant County had an increase of 3,326 persons, from 27,676 in 1990 to 31,002 in 2000 (U.S. Census Bureau 1990, 2001b). Population statistics for Silver City are identified and compared to the county, state, and national levels in **Table 3-3**. Thirty-four percent of the county population resides in Silver City, the only major urban center in the county. Consequently, statistics at the county level might reflect the urban concentration of people, and may not be comparable to the rural nature of the project area.

There are seven property owners with 106 acres that use the irrigation ditch. Irrigation is used for hay pasture, orchards, and home gardens. The irrigation can be said to supplement the income for only a few of the landowners, who rely on other income sources. The Proposed Action is expected to provide reliable delivery of water for irrigating along the ditch during the growing season, potentially increasing productivity on this land. While locally favorable for the affected landowners, the economic value of this benefit is not quantifiable. If implementation of the No Action alternative results in failure of the ditch system, the lack of water delivery would negatively affect the income of the landowners currently irrigating from the ditch system.

Table 3.3. Profile of Demographic Characteristics, Year 2000

Geographic Area	Total Population	Race								Hispanic or Latino (of Any Race)
		One Race							Two or More Races	
		Total	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race		
U.S.	281,421,906	274,595,678	211,460,626 (77%)	34,658,190 (13%)	2,475,956 (<1%)	10,242,998 (4%)	398,835 (<1%)	15,359,073 (6%)	6,826,228	35,305,818 (13%)
New Mexico	1,819,046	1,752,719	1,214,253 (69%)	34,343 (2%)	173,483 (10%)	19,255 (1%)	1,503 (<1%)	309,882 (18%)	66,327	765,386 (44%)
Grant County	31,002	30,037	23,459 (78%)	162 (<1%)	419 (1%)	89 (<1%)	10 (<1%)	5,898 (20%)	965	15,126 (50%)
Silver City	10,545	10,190	7,563 (74%)	91 (<1%)	120 (<1%)	47 (<1%)	5 (<1%)	2,364 (23%)	355	5,529 (52%)

Sources: U.S. Census Bureau 2001a,b.

3.14 ENVIRONMENTAL JUSTICE

EO 12898, Environmental Justice, and EO 13045, Protection of Children, requires that federal proponents assess how impacts of a Proposed Action may disproportionately affect minority, and low-income persons or children under 18 years of age. Minority populations include all persons identified by the U.S. Bureau of the Census to be either of Hispanic race, regardless of country of origin, or all persons not of Hispanic origin other than White (i.e., Black, American Indian, Eskimo or Aleut, Asian or Pacific Islander, or other national origins). Low-income populations include all persons living below the poverty level, identified as a household income for a family of three of less than \$13,003 in 1998 (U.S. Census Bureau 2002).

As shown in Table 3-3, Silver City has a slightly higher percentage of Hispanics or Latinos (52 percent), when compared to 50 percent for Grant County, and 44 and 13 percent for the state and nation, respectively. No other minority group is disproportionately over-represented at either the local or county level. According to the 2000 census, approximately 25 percent of the population of Silver City (2,641 persons) was under age 18. This is not inconsistent with other political levels, although it is slightly higher. In New Mexico, 28 percent of the population is under age 18; Grant County, 26.2; U.S., 25.7 (U.S. Census Bureau 2001b). 1998 poverty estimates from the census for the county, state, and national level are shown in **Table 3-4**. It is possible to conservatively estimate that the poverty level for San Lorenzo would be within those ranges.

The Proposed Action alternative is expected to have a minor beneficial impact on about seven families. Assuming that these owners are comprised of a similar racial and ethnic mix as the county as a whole, this could provide a positive effect for minorities. Any primary or supplemental income from trading would also be beneficial. Overall, minor social and economic benefits could result from the Proposed Action alternative in the local community. There would be no effect from the No Action alternative.

Table 3-4. Percent Below Poverty, 1998 Estimate

	<i>Grant County</i>	<i>New Mexico</i>	<i>United States</i>
All Persons	19.6	19.0	12.7
Children	27.0	27.1	18.9

Sources: U.S. Census Bureau 1998a,b.

3.15 CUMULATIVE EFFECTS OF THE PROJECT

No other foreseeable actions by federal, state, tribal, or local officials are known to be planned for the project area. According to the field survey, the entire Ancheta Galaz Community Ditch has been previously modified by concrete lining and structures. The Proposed Action would involve construction in a previously disturbed area. Therefore, the only potential impacts due to the implementation of the Proposed Action would not significantly affect natural, cultural, or socioeconomic resources.

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4.0 CONCLUSIONS

The No Action alternative was rejected because the present irrigation system is in need of improvement to preserve its function. This alternative would not meet the purpose and need of the project to reduce maintenance and increase water delivery efficiency, nor would it preserve the cultural and historic values of this acequia, as intended under Section 1113 of the WRDA.

The Proposed Action is the preferred alternative and would be beneficial to the entire ditch and its users by replacing and stabilizing the damaged portion of the ditch. It has the potential to result in positive impacts by improving reliable water delivery during the irrigation season. This alternative satisfies the purpose and need for the project and the intent of Section 1113 of WRDA.

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5.0 LIST OF PREPARERS, CONSULTATION, AND COORDINATION

5.1 LIST OF PREPARERS

- Fritz Blake, Corps Program Manager for Acequia Rehabilitation Program
- Gary Lopez, Corps Project Manager
- Patricia Phillips, Corps EA Project Manager
- Gregory Everhart, Corps Archaeologist
- Robin Brandin, SAIC QA/QC
- Ellen Dietrich, SAIC Project Manager
- Neal Ackerly, Dos Rios Consultants, Inc., Archaeologist
- David Dean, SAIC Biologist
- Heather Gordon, SAIC Environmental Scientist/GIS Specialist

5.2 COORDINATION

Agencies and entities contacted formally or informally in preparation of this Final EA include:

- Ancheta Galaz Community Ditch, Reuben Montoya, Ditch Association Secretary
- Natural Resources Conservation Service
- New Mexico Department of Energy, Minerals, and Natural Resources
- New Mexico Department of Game and Fish
- New Mexico Environment Department
- New Mexico Office of the State Engineer
- New Mexico State Historic Preservation Office
- San Carlos Apache Tribe
- U.S. Fish and Wildlife Service
- White Mountain Apache Tribe

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6.0 REFERENCES

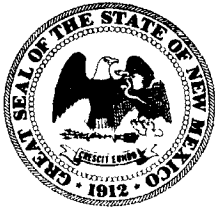
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Appendix A
Agency Comments On
Draft Environmental Assessment



GARY E. JOHNSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT

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1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2855
Fax (505) 827-2836



JOHN D'ANTONIO, Jr.
SECRETARY

November 16, 2002

Ellen Dietrich
SAIC Project Manager
Science Application International Corp.
2109 Air Park Road SE
Albuquerque, NM 87106

Dear Ms. Dietrich:

**RE: DRAFT ENVIRONMENTAL ASSESSMENT FOR REHABILITATION OF
ANCHETA GALAZ COMMUNITY DITCH, GRANT COUNTY, NM**

This transmits New Mexico Environment Department (NMED) staff comments concerning the above-referenced Draft Environmental Assessment (EA).

General Comments:

In the late spring of 2000, NMED'S Surface Water Quality Bureau (SWQB) staff met on site with Dan Malanchuk (USACE), Dennis Coleman (USF&WS), Frank Corn (NRCS), and users of the Ancheta Ditch to discuss bank stabilization strategies and regulatory requirements for addressing the erosion problem at the Ancheta Ditch near the NM Highway 152 Bridge at the Mimbres River. At that meeting it was agreed that the NMSH&TD would come in and create a temporary channel to keep the runoff from the upcoming thunderstorm season away from the cut bank where the concrete lined ditch was about to fall into the channel. This temporary action was intended to allow the ditch association some time to come up with a plan to address the problem and to secure the funds needed to implement a solution.

This particular reach of the Mimbres River (spanning the approximate 0.75 miles from the Ancheta Ditch point of diversion downstream to the NM Highway 152 Bridge) exhibits significant variance from a properly functioning river. Historic manipulation of the stream channel, riparian corridor, and adjacent floodplain, coupled with poor land management practices in the watershed uplands have left the river deeply incised and hydrologically separated from its floodplain. Hardened concrete diversion structures, hardened bank stabilization techniques, and the narrow span of the NM Highway 152 Bridge all tend to keep the river from obtaining the new equilibrium necessary to minimize erosion rates, transport the sediment load efficiently, and dissipate high velocity flows from large floods via the over banking mechanism common to most rivers located in low-gradient wide alluvial valleys. This action will only postpone (deter is the

word used in the EA) further erosion and future ditch failure. However, at this particular site allowing the river to widen the incised channel to obtain a more natural function is not practical. In this case, the highway and the irrigation structures limit the bank stabilization techniques to the construction of hardened structures. At the meeting in the spring of 2000, it was also agreed that stabilization of the bank where the Ancheta Ditch was falling into the channel would coincide with work the NMH&TD needed at the NM Highway 152 Bridge.

Specific Recommendations:

The structure proposed for stabilizing the east bank should tie into the riprap blanket on the upstream east side of the bridge. Additional hardening of the west bank should also tie into the bridge riprap blanket.

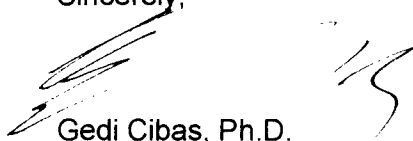
All the usual Best Management Practices implemented in similar projects are recommended for this project in order to be reasonably assured that State standards are not exceeded. It is especially important that spill cleanup and containment kits should be available on site at all times to address any leaking fuels or hydraulic fluids from heavy equipment. The usual Best Management Practices applicable to construction activities within the ordinary highwater mark follow:

- Work shall be conducted during conditions of no flow or minimum flow.
- The construction area shall be protected such that runoff from a precipitation event will not move any disturbed soil to surface water. Prior to beginning construction, erosion control measures (e.g., silt fence, straw bales) must be installed within the project area to prevent the movement of disturbed soil or other contaminants into surface water. The erosion control measures must be inspected and maintained on a regular basis to ensure they are working properly.
- During any in-channel work, flowing water must be temporarily diverted by placing diversion barriers (e.g., coffer dam, sand bags, concrete bases, water bladders, diversion boards) around the work area to minimize sedimentation and turbidity in surface waters. The water downstream of the project area must be as clear as the water upstream of the project area.
- Disturbed soil and replaced fill shall be properly stabilized and re-vegetated after completion of the work to prevent erosion. All areas that are disturbed/impacted as a result of the project must be replanted/seeded with suitable vegetation until the area is no longer subject to erosion into surface water. Native riparian and/or wetland species must be used in areas that support such vegetation. Silt fences or other erosion control measures must remain on-site and maintained until the disturbed areas are permanently vegetated.
- Temporary mats must be placed on creek banks, riparian areas, and wetlands where heavy equipment will be positioned to minimize impacts to soil and vegetation.

- All heavy equipment used in the project area shall be cleaned prior to the start of the project and inspected daily for leaks. Leaking equipment must not be used in or near any watercourse. Park equipment outside the channel when not in use.
- Fuel, oil, hydraulic fluid, and other substances of this nature must not be stored within the normal floodplain and must have a secondary containment system to prevent spills if the primary storage container leaks. Refuel equipment at least 100 feet from surface water.
- Any concrete to be poured must be fully contained in waterproof forms to prevent accidental releases. No discharge of any concrete to surface or ground water may occur. Cement dumping in the vicinity of watercourses is strictly prohibited and must be performed in proper containment areas.
- Spill clean-up materials (e.g., booms, absorbent pads) must be available on-site at all times during construction. Report all spills immediately to the SWQB as required by the New Mexico Water Quality Control Commission regulations (20.6.2.1203 NMAC).
- The SWQB must be notified at least 5 days before you start construction. This notice will allow time to schedule monitoring or inspections if necessary.

We appreciate the opportunity to comment on this project.

Sincerely,



Gedi Cibas, Ph.D.
Environmental Impact Review Coordinator

NMED File No. 1665ER



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

January 13, 2003

Cons. # 2-22-03-I-038

Ellen Dietrich, Project Manager
Science Applications International Corporation
2109 Air Park Road, SE
Albuquerque, New Mexico 87106

Dear Ms. Dietrich:

Thank you for the opportunity to review the draft environmental assessment, dated October 2002, for the Rehabilitation of the Ancheta Galaz Community Ditch in Grant County, New Mexico. The proposed project is located on the Mimbres River upstream from the bridge on State Route 152 near the community of San Lorenzo. The proposed project would consist of realigning and concrete lining a segment of the irrigation ditch, protecting the adjacent streambanks from further erosion, and removing a 330-foot long channel fill berm that obstructs flows. The new concrete-lined ditch is 220 feet long, and the east and west bank stabilization structures are 430 and 150 feet long, respectively.

In general, the draft assessment adequately addresses fish and wildlife resource concerns. The U.S. Fish and Wildlife Service (Service) recommends that the beneficial conservation measures that you proposed in the draft assessment be incorporated into the final environmental assessment and into the work plan for this project. These measures include the following:

- The Chiricahua leopard frog (*Rana chiricahuensis*) (frog) and Chihuahua chub (*Gila nigrescens*) (chub) have been observed 5 miles downstream from the project area near the village of San Juan. Construction activities would be done during the winter when the likelihood of frog and chub migration, movements, and reproduction are minimal. In addition, river flows are low in winter and less sediment would be transported downstream that might impact known occupied frog and chub habitats.
- An open river channel would be maintained through the project area for possible movement of frogs and chubs into or through the area.
- The 330-foot loose berm would be removed that was placed in the river channel to divert the river to the west side of the channel away from the eroded bank. Silt fences or traps would be installed to reduce sediment discharge.

- Metal matting would be used for equipment operating in the streambed to reduce sediment discharge into the river.
- Construction vehicles would use rubber tires to minimize soil compaction in the riparian zone and reduce sediment discharge.
- After completing the stabilization and realignment construction, the riparian vegetation would be replaced with a mixture of native vegetation, such as cottonwoods and willows along the base of the post, wire, and rock structure, and native grasses on the slope.
- If bald eagles (*Haliaeetus leucocephalus*) are observed within 0.5 miles of the project area, construction activities would be suspended until they leave of their own volition.

In addition, the Service provides the following recommendations to offset other possible adverse effects to fish and wildlife resources and listed species for the proposed project:

- Rock gabion structures, such as those proposed for the east-side bank stabilization, frequently fail during high flows. The U.S. Army Corps of Engineers (Corps) reported that most of their streambank stabilization structures on the Gila and San Francisco Rivers failed during flood events (Corps 1997). A structural failure would result in sediment behind these structures being washed downstream, which could silt in riffle gravels and fill in pools. Therefore, the Service recommends that the east side streambank stabilization be accomplished with native vegetation and bioengineering rather than the gabion structure. The streambank stabilization may be accomplished by sloping the eroded streambank to 2:1 or less, planting native vegetation (particularly willows and cottonwoods), and placing root wads and logs to protect the foot of the streambank.
- If the gabion structure is used, it should be reinforced to withstand flood events. We recommend that the east-side eroded bank should be sloped back from the top of the gabion basket structure at a slope of 2:1 or less and revegetated with native vegetation. We suggest that the upstream end of the structure be reinforced with root wads and revegetated with willows to reduce the chances of the river cutting the streambank behind the structure. We also recommend that the gabion structure be set back as far as possible to allow the river to have a larger channel capacity and additional lateral movement. This would reduce streambank erosion and reduce sediment discharge to the river.
- The west-side bank stabilization is proposed using rip-rap. We suggest that native vegetation be used for bank stabilization rather than rip-rap. If rip-rap is used, we suggest that willows and cottonwoods be planted within the rip-rap area for aesthetics, increased bank stabilization, and wildlife habitat.
- We note that about 600 linear feet of streambank riparian vegetation could be affected by the project. We recommend that any woody riparian vegetation that is removed be replaced by establishing two acres of native vegetation for every acre impacted. If trees are removed,

we recommend a minimum ratio of 10 saplings for each tree removed. We also recommend that trees be wrapped or enclosed with chicken wire or a suitable alternative to prevent damage by beavers, other wildlife, or livestock.

Based on our review of the draft environmental assessment, we also recommend the following information be included in the request for concurrence with your effects determinations:

- Because section 7 consultation under the Endangered Species Act, as amended (Act), applies to Federal agencies, the request for concurrence should be sent either by the Corps, or the Corps should designate in writing that Science Applications International Corporation is its official representative for purposes of this consultation.
- Consultation will be performed on the final proposed action, including any revisions that may have been incorporated from comments submitted on the draft assessment.
- The frog has been known to breed during winter months. We recommend that the proposed action for this project include a survey by a qualified surveyor prior to project initiation, if there is suitable breeding habitat for this species at that time in the action area.
- Please provide a detailed native riparian revegetation plan in the final project proposal, including quantities, acreage and species that will be planted, and a monitoring plan to determine success of the riparian habitat. We recommend that revegetation be planned to provide frog and other wildlife habitat, and we are available to provide technical assistance to help with this objective.

To further assist you in the preparation of the final environmental assessment, we have enclosed a current list of federally endangered, threatened, proposed, and candidate species, and species of concern that may be found in Grant County, New Mexico. Additional information about these species is available on the Internet at <<http://nrmhp.unm.edu/bisonm/bisonm.cfm>>, <<http://nmrareplants.unm.edu>>. and <<http://ifw2es.fws.gov/endangeredspecies>>. Under the Act, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with us further. If your action area has suitable habitat for any of these species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (*e.g.*, equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects.

Candidates and species of concern have no legal protection under the Act and are included in this document for planning purposes only. We monitor the status of these species. If significant declines are detected, these species could potentially be listed as endangered or threatened.

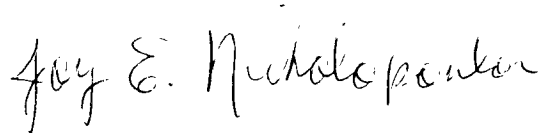
Therefore, actions that may contribute to their decline should be avoided. We recommend that candidates and species of concern be included in your surveys.

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure no net loss of wetlands function and value.

The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service. To minimize the likelihood of adverse impacts to all birds protected under the MBTA, we recommend construction activities occur outside the general migratory bird nesting season of March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until nesting is complete.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. It should also be noted that Corps staff contributed a considerable amount of early coordination to work with the Service to design this project. In future correspondence regarding this project, please refer to consultation # 2-22-03-I-038. If you have any questions about the information in this letter, please contact Patricia Zenone at the letterhead address or at (505) 761-4718.

Sincerely,

A handwritten signature in cursive script that reads "Joy E. Nicholopolous".

Joy E. Nicholopolous
Field Supervisor

Enclosure

cc: (w/o enc)

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry
Division, Santa Fe, New Mexico

(w/enc)

U. S. Army Corps of Engineers, Albuquerque District, Environmental Resources Branch,
Albuquerque, New Mexico (Attn: P. Phillips)

LITERATURE CITED

U. S. Army Corps of Engineers. 1997. Lessons Learned: Gila River, New Mexico, Local Protection Projects. Albuquerque District, Albuquerque, New Mexico. 43pp.

FEDERAL ENDANGERED, THREATENED, PROPOSED, AND CANDIDATE SPECIES,
AND SPECIES OF CONCERN IN GRANT COUNTY, NEW MEXICO

Consultation Number 2-22-03-I-038

January 13, 2003

ENDANGERED

Black-footed ferret (*Mustela nigripes*) **
Mexican gray wolf (*Canis lupus baileyi*) Experimental Nonessential
Northern aplomado falcon (*Falco femoralis septentrionalis*)
Southwestern willow flycatcher (*Empidonax traillii extimus*) (**Note:** Critical habitat was set aside by the 10th Circuit Court of Appeals on 5/11/01)
Gila topminnow (*Poeciliopsis occidentalis*)***
Gila trout (*Oncorhynchus gilae*)

THREATENED

Bald eagle (*Haliaeetus leucocephalus*)
Mexican spotted owl (*Strix occidentalis lucida*)
Beautiful shiner (*Cyprinella formosa*)***
Chihuahua chub (*Gila nigrescens*)
Loach minnow (*Tiaroga cobitis*) with critical habitat
Spikedace (*Meda fulgida*) with critical habitat
Chiricahua leopard frog (*Rana chiricahuensis*)

PROPOSED ENDANGERED

Gila chub (*Gila intermedia*) with critical habitat

CANDIDATE

Yellow-billed cuckoo (*Coccyzus americanus*)
Gila pyrg (springsnail) (*Pyrgulopsis gilae*)
New Mexico pyrg (springsnail) (*Pyrgulopsis thermalis*)

SPECIES OF CONCERN

Townsend's big-eared bat (*Corynorhinus townsendii*)
White-sided jackrabbit (*Lepus callotis gaillardi*)
American peregrine falcon (*Falco peregrinus anatum*)
Arctic peregrine falcon (*Falco peregrinus tundrius*)
Baird's sparrow (*Ammodramus bairdii*)
Bell's vireo (*Vireo bellii*)
Common black hawk (*Buteogallus anthracinus*)
Northern goshawk (*Accipiter gentilis*)
Desert sucker (*Catostomus clarki*)
Roundtail chub (*Gila robusta*)
Sonora sucker (*Catostomus insignis*)
Rio Grande sucker (*Catostomus plebeius*)
Mexican garter snake (*Thamnophis eques*)
Narrowhead garter snake (*Thamnophis rufipunctatus*)

Lowland leopard frog (*Rana yavapaiensis*)
 Desert viceroy butterfly (*Limenitis archippus obsoleta*)
 New Mexico silverspot butterfly (*Speyeria nokomis nitocris*)
 Shortneck snaggleteeth (snail) (*Gastrocopta dalliana dalliana*)
 Desert night-blooming cereus (*Cereus greggii* var. *greggii*)
 Dwarf milkweed (*Asclepias uncialis* var. *uncialis*)
 Parish's alkali grass (*Puccinellia parishii*)
 Pinos Altos flame flower (*Talinum humile*)
 Porsild's starwort (*Stellaria porsildii*)
 San Carlos wild-buckwheat (*Eriogonum capillare*)
 Slender spiderflower (*Cleome multicaulis*)
 Wright's dogweed, (*Adenophyllum wrightii* var. *wrightii*)

Index

Endangered	=	Any species which is in danger of extinction throughout all or a significant portion of its range.
Threatened	=	Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
Candidate	=	Candidate Species (taxa for which the Service has sufficient information to propose that they be added to list of endangered and threatened species, but the listing action has been precluded by other higher priority listing activities).
Species of Concern	=	Taxa for which further biological research and field study are needed to resolve their conservation status <u>OR</u> are considered sensitive, rare, or declining on lists maintained by Natural Heritage Programs, State wildlife agencies, other Federal agencies, or professional/academic scientific societies. Species of Concern are included for planning purposes only.
**	=	Survey should be conducted if project involves impacts to prairie dog towns or complexes of 200-acres or more for the Gunnison's prairie dog (<i>Cynomys gunnisoni</i>) and/or 80-acres or more for any subspecies of Black-tailed prairie dog (<i>Cynomys ludovicianus</i>). A complex consists of two or more neighboring prairie dog towns within 4.3 miles (7 kilometers) of each other.
***	=	Extirpated in this county



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
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Phone: (505) 346-2525 Fax: (505) 346-2542

February 27, 2003

Cons. # 2-22-03-I-038

Julie A. Hall, Chief, Environmental Resources Branch
U. S. Army Corps of Engineers
Albuquerque District
Albuquerque, New Mexico 87109

Dear Ms. Hall:

Thank you for your letter received by the U.S. Fish and Wildlife Service (Service) on January 30, 2003, requesting concurrence with your biological evaluation for Rehabilitation of the Anchera Galaz Community Ditch in Grant County, New Mexico. The proposed project is located on the Mimbres River upstream from the bridge on State Route 152 near the community of San Lorenzo. The proposed project would consist of realigning and concrete lining a segment of the irrigation ditch, protecting the adjacent streambanks from further erosion, and removing a 330-foot long channel fill berm that obstructs flows. The new concrete-lined ditch is 220 feet long, and the east and west bank stabilization structures are 430 and 150 feet long, respectively.

You have determined that this project "may affect, but is not likely to adversely affect" the threatened Chiricahua leopard frog (*Rana chiricahuensis*) (frog), Chihuahua chub (*Gila nigrescens*) (chub) and bald eagle (*Haliaeetus leucocephalus*). The Service concurs with these determinations based on the beneficial conservation measures included in your final proposed action. These include the following:

- The frog and chub have been observed 5 miles downstream from the project area near the village of San Juan. Construction activities will be done during the winter when the likelihood of frog and chub migration, movements, and reproduction are minimal. In addition, river flows are low in winter and less sediment will be transported downstream that might impact known occupied frog and chub habitats.
- A survey of the action area by a qualified biologist will be performed for the frog and its suitable habitat prior to project construction.
- An open river channel will be maintained through the project area for possible movement of frogs and chubs into or through the area.

Julie A. Hall, Chief, Environmental Resources Branch

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- The 330-foot loose berm will be removed that was placed in the river channel to divert the river to the west side of the channel away from the eroded bank. Silt fences or traps will be installed to reduce sediment discharge. Approximately 0.3 acre of streambed will be restored by removing the berm to benefit the frog and chub.
- Metal matting will be used for equipment operating in the streambed to reduce sediment discharge into the river.
- Construction vehicles will use rubber tires to minimize soil compaction in the riparian zone and reduce sediment discharge.
- After completing the stabilization and realignment construction, the riparian vegetation will be replaced with a mixture of native vegetation, including cottonwoods and willows along the base of the post, wire, and rock structure, and native grasses and flowering plants on the slope. All disturbed areas will be planted and monitored for 3 years to determine survival. Cottonwoods will be replaced at a ratio of 10 saplings for every tree removed, and they will be protected from damage by animals.
- If bald eagles are observed within 0.5 miles of the project area, construction activities will be suspended until they leave of their own volition.

Please contact the Service to verify the above determination and concurrence are still valid if:

- 1) Future surveys detect listed, proposed or candidate species in habitats where they have not been previously observed;
- 2) the projects are changed or new information reveals effects of the actions to the listed species or their habitats to an extent not considered in these evaluations; or
- 3) a new species is listed that may be affected by these projects.

This concludes section 7 consultation on the Rehabilitation of the Ancheta Galaz Community Ditch. The Service appreciates the substantial amount of information and analysis contributed by Corps staff in preparing this evaluation and your commitment to avoid adverse effects to listed species. In future correspondence regarding this project, please refer to consultation # 2-22-03-I-038. If you have any questions about the information in this letter, please contact Patricia Zenone of my staff at the letterhead address or at (505) 761-4718.

Sincerely,



Joy E. Nicholopolous
Field Supervisor



Julie A. Hall, Chief, Environmental Resources Branch

3

cc:

Project Manager, Science Applications International Corporation, 2109 Air Park Road, SE,
Albuquerque, New Mexico 87106 (Attn: Ellen Dietrich)

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico

Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry
Division, Santa Fe, New Mexico

Appendix B
Consultation with State Historic Preservation Office



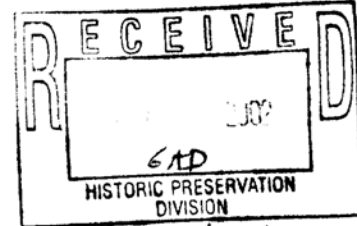
Reply to
Attention of:

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

October 31, 2002

Engineering and Construction Division
Environmental Resources Branch

Ms. Jan Biella
Acting State Historic Preservation Officer
New Mexico State Historic Preservation Bureau
228 East Palace Avenue, Room 320
Santa Fe, New Mexico 87501



066282

Rec'd 11-29-2002-
GDE

Dear Ms. Biella:

Pursuant to 36 CFR Part 800, the U. S. Army Corps of Engineers (Corps), Albuquerque District, is seeking your concurrence in our determination of "No Adverse Effect to Historic Properties" for the proposed rehabilitation of a portion of the Ancheta Galaz Community Ditch. The Corps, at the request of the New Mexico State Engineer and the Ancheta Galaz Community Ditch Commission, is planning the rehabilitation project under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 et. seq.), as amended. The project area is located on the Mimbres River immediately upstream of New Mexico State Highway 152 bridge, about 1 mile south of San Lorenzo, Grant County, New Mexico.

The proposed project, a Natural Resources Conservation Service design, would realign and reconstruct a 220-foot segment of the ditch that has been destroyed by high river flows. The project would also install approximately 430 feet of streambank protection on the left-hand (east) bank of the Mimbres River and install about 150 feet of streambank protection on the right-hand (west) bank. The proposed project would not change the acequia's intended function or form, and would only slightly realign a small portion of the ditch. On August 6, 2002, Dos Rios Consultants, Inc. conducted the cultural resources survey and prepared the enclosed report entitled, **Cultural Resources Survey Report for the Ancheta Galaz Community Ditch, Grant County, New Mexico** (NMCRIIS No. 80295). The survey covered 100 percent of the project area for a total of 4.55 acres (1.8 hectares). While there are five (5) previously recorded archaeological sites reported to occur in the area, no prehistoric or historic artifacts, cultural resource manifestations, archaeological sites, or historic properties were found during the survey or are known to occur in the immediate vicinity of the project area.

-2-

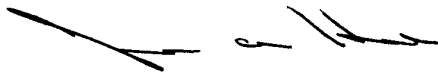
The Ancheta Galaz Community Ditch dates to 1870 and is potentially eligible for inclusion to the National Register of Historic Places under criterion a and d of 36 CFR 60.4. The acequia system's earthen ditches and structural components have been subject to years of maintenance, rebuilt, and realigned numerous times. In the late 1950s and early 1960s, the entire 0.75-mile ditch was concrete lined. Therefore, 100 percent of the acequia system has been modified. The proposed realignment of a 220-foot segment of ditch would move the irrigation ditch further to the east away from the eroding riverbank. Streambank protection would be constructed to prevent further bank erosion. The proposed project would not change the intended function or form of the acequia or those attributes that contribute to the acequia's cultural and historic significance. The proposed realignment of the short section of the ditch would have a negligible effect.

Based on the information provided in the enclosed report, the Corps is of the opinion that the proposed Ancheta Galaz rehabilitation project would have "No Adverse Effect to Historic Properties" and that there would be "No Effect" to other cultural resources that occur in the area.

Pursuant to 36 C.F.R. 800.11, should previously unknown artifacts or cultural resource manifestations be encountered during construction, work would cease in the immediate vicinity of the resource, a determination of significance made and a mitigation plan formulated in consultation with the New Mexico State Historic Preservation Officer, the White Mountain and San Carlos Apache Tribes, and with any other Native American groups that may have interest or concerns in the project area.

If you have any questions or require additional information, please contact Mr. Gregory Everhart at (505) 342-3352 or Dr. John Schelberg at (505) 342-3359.

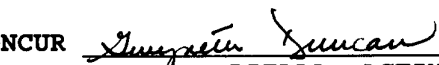
Sincerely,



Julie A. Hall
Chief, Environmental Resources Branch

11-25-02
Date

I CONCUR


for JAN V. BIELLA, ACTING
NEW MEXICO STATE HISTORIC
PRESERVATION OFFICER

-3-

Enclosures

Copy Furnished: (w/o enclosures)

Don Klima, Director
Advisory Council on Historic Preservation
Office of Planning and Review
12136 W. Bayaud Ave., #330
Lakewood, Colorado 80228-2115

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Appendix C
Tribal Consultation Letters



Reply to
Attention of

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

SEP 20 2002

Engineering and Construction Division
Environmental Resources Branch

Honorable Raymond Stanley, Sr.
Tribal Administrator, San Carlos Apache Tribe
Post Office Box 0
San Carlos, Arizona 85550

Dear Administrator Stanley:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Ancheta Galaz Community Ditch Association, is planning the rehabilitation of the Ancheta Galaz conveyance ditch under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 et. seq.), as amended. The project area is located on the Mimbres River immediately upstream from the State Highway 152 bridge near San Lorenzo, Grant County, New Mexico.

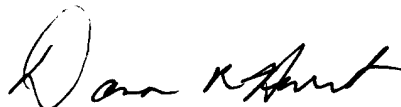
The proposed project would involve the concrete lining of approximately 450 feet of the ditch conveyance and streambank stabilization of approximately 430 feet along the east bank and 150 feet along the west bank of the Mimbres River. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service (copy enclosed).

The Corps is seeking early input for consideration during planning of the project. Your input will also be used in preparing an environmental assessment to comply with the National Environmental Policy Act (NEPA). Therefore, please use this opportunity to identify any potential issues or areas of concern to the people of your community. Written comments, supporting information, data, and/or references should be submitted **no later than October 25, 2002**.

Please provide written comments regarding environmental concerns to Ms. Patty Phillips and comments regarding cultural resources to Mr. Gregory Everhart at the above address.

If you have any questions or require additional information, please contact Ms. Phillips at (505) 342-3354 or Mr. Everhart at (505) 342-3352.

Sincerely,

A handwritten signature in black ink, appearing to read "Dana R. Hurst". The signature is fluid and cursive, with the first name "Dana" being more prominent.

Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures



Reply to
Attention of:

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

SEP 20 2002

Engineering and Construction Division
Environmental Resources Branch

Honorable Dallas Massey, Sr.
Chairman, White Mountain Apache Tribe
Post Office Box 700
Whiteriver, Arizona 85941

Dear Chairman Massey:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Ancheta Galaz Community Ditch Association, is planning the rehabilitation of the Ancheta Galaz conveyance ditch under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 et. seq.), as amended. The project area is located on the Mimbres River immediately upstream from the State Highway 152 bridge near San Lorenzo, Grant County, New Mexico.

The proposed project would involve the concrete lining of approximately 450 feet of the ditch conveyance and streambank stabilization of approximately 430 feet along the east bank and 150 feet along the west bank of the Mimbres River. The project utilizes a design prepared by the U.S. Department of Agriculture's Natural Resources Conservation Service (copy enclosed).

The Corps is seeking early input for consideration during planning of the project. Your input will also be used in preparing an environmental assessment to comply with the National Environmental Policy Act (NEPA). Therefore, please use this opportunity to identify any potential issues or areas of concern to the people of your community. Written comments, supporting information, data, and/or references should be submitted **no later than October 25, 2002**.

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If you have any questions or require additional information, please contact Ms. Phillips at (505) 342-3354 or Mr. Everhart at (505) 342-3352.

Sincerely,

A handwritten signature in black ink, appearing to read "Dana R. Hurst". The signature is fluid and cursive, with the first name "Dana" being the most prominent.

Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures



Reply to
Attention of:

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

NOV 04 2002

Engineering and Construction Division
Environmental Resources Branch

Honorable Raymond Stanley, Sr.
Chairman, San Carlos Apache Tribe
Post Office Box 0
San Carlos, Arizona 85550

Dear Chairman Stanley:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Ancheta Galaz Community Ditch Commission, is planning an acequia rehabilitation project under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 et. seq.), as amended. The proposed project would rehabilitate a segment of the acequia's ditch destroyed by high river flows and install streambank protection in two locations. The proposed project utilizes a Natural Resources Conservation Service design. The project area is located on the Mimbres River immediately upstream of the State Highway 152 bridge, about 1 mile south of San Lorenzo, Grant County, New Mexico.

Enclosed for your review are drafts of the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) entitled, **Environmental Assessment for Rehabilitation of Ancheta Galaz Community Ditch, Grant County, New Mexico**. The Albuquerque office of Science Applications International Corporation conducted the environmental survey and prepared the draft EA and FONSI. Also enclosed, for your review, is the cultural resources report entitled, **Cultural Resources Survey Report for the Ancheta Galaz Community Ditch, Grant County, New Mexico** (NMCRIIS No. 80295). Dos Rios Consultants, Inc., conducted the cultural resources survey on August 6, 2002 and prepared the cultural resources report.

The Corps is sending copies of the draft EA and FONSI and the draft cultural resources report and soliciting comments from those who may have a direct interest in the project. Please review and provide written comments regarding the draft EA and

- 2 -

FONSI to Ms. Patty Phillips and comments regarding the draft cultural resources report to Mr. Gregory Everhart at the above address. Written comments should be submitted **no later than December 5, 2002**, so that we may incorporate comments, if necessary, and complete National Environmental Policy Act compliance.

Based on the information provided in the enclosed reports, the Corps is of the opinion that the proposed Ancheta Galaz acequia rehabilitation project would have "No Adverse Effect to Historic Properties" and that there would be "No Effect" to other cultural resources that occur in the area.

Should previously unknown artifacts or cultural resource manifestations be encountered during construction, work would cease in the immediate vicinity of the resource, a determination of significance made, and a mitigation plan formulated in consultation with Native American groups that may have interest or concerns in the project area and with New Mexico State Historic Preservation Officer.

If you have any questions or require additional information, please contact Ms. Phillips, Biologist, at (505) 342-3354 or Mr. Everhart, Archeologist, at (505) 342-3352.

Sincerely,



Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures



Reply to
Attention of:

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

NOV 04 2002

Engineering and Construction Division
Environmental Resources Branch

Honorable Dallas Massey, Sr.
Chairman, White Mountain Apache Tribe
Post Office Box 1150
Whiteriver, Arizona 85941

Dear Chairman Massey:

The U.S. Army Corps of Engineers (Corps), Albuquerque District, at the request of the New Mexico State Engineer and the Ancheta Galaz Community Ditch Commission, is planning an acequia rehabilitation project under the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 et. seq.), as amended. The proposed project would rehabilitate a segment of the acequia's ditch destroyed by high river flows and install streambank protection in two locations. The proposed project utilizes a Natural Resources Conservation Service design. The project area is located on the Mimbres River immediately upstream of the State Highway 152 bridge, about 1 mile south of San Lorenzo, Grant County, New Mexico.

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Based on the information provided in the enclosed reports, the Corps is of the opinion that the proposed Ancheta Galaz acequia rehabilitation project would have "No Adverse Effect to Historic Properties" and that there would be "No Effect" to other cultural resources that occur in the area.

Should previously unknown artifacts or cultural resource manifestations be encountered during construction, work would cease in the immediate vicinity of the resource, a determination of significance made, and a mitigation plan formulated in consultation with Native American groups that may have interest or concerns in the project area and with New Mexico State Historic Preservation Officer.

If you have any questions or require additional information, please contact Ms. Phillips, Biologist, at (505) 342-3354 or Mr. Everhart, Archeologist, at (505) 342-3352.

Sincerely,



Dana R. Hurst
Lieutenant Colonel, EN
District Engineer

Enclosures

Appendix D
Cultural Resources Survey Report

**CULTURAL RESOURCES SURVEY REPORT FOR THE
ANCHETA GALAZ COMMUNITY DITCH
GRANT COUNTY, NEW MEXICO**

By
Neal W. Ackerly, Ph.D.

Prepared by
Dos Rios Consultants, Inc.
P.O. Box 1247
Silver City, NM 88062

under subcontract to
Science Applications International Corporation

for the
U.S. Army Corps of Engineers, Albuquerque District,
as part of the Acequia Rehabilitation Program

DACA47-97-D-0009
Delivery Order 14

February 2003

New Mexico Cultural Resources Information System No. 80295

1.0 ABSTRACT

On August 6, 2002, an archaeologist from Dos Rios Consultants, Inc., subcontractor to SAIC under contract to the U.S. Army Corps of Engineers, Albuquerque District (Corps), conducted a cultural resources inventory survey of the proposed construction area along the Ancheta Galaz Community Ditch near the hamlet of San Lorenzo in Grant County, New Mexico. A Class III field inspection of the project area consisted of 100 percent coverage using 15-meter transects. A total of approximately 4.55 acres was examined, including proposed bank stabilization areas. Recording activities conformed to all State of New Mexico and federal recording standards. The survey was conducted in anticipation of construction activities focusing on the replacement of a collapsed concrete-lined portion of the Ancheta Galaz Community Ditch, as well as proposed stabilization of the banks of the Mimbres River adjacent to the ditch. No prehistoric or historic archaeological sites were found or are known to occur within or immediately adjacent to this acequia. The Ancheta Galaz Community Ditch is potentially eligible for inclusion on the National Register of Historic Places under Criteria a and d of 36 Code of Federal Regulations (CFR) 60.4. The proposed rehabilitation would have no effect on the alignment, form, or function of the acequia system. It is recommended, based on the proposed work and the findings of this cultural resources survey, that a clearance be provided for this proposed rehabilitation project. There would be “No Adverse Effect to Historic Properties” by the proposed rehabilitation project.

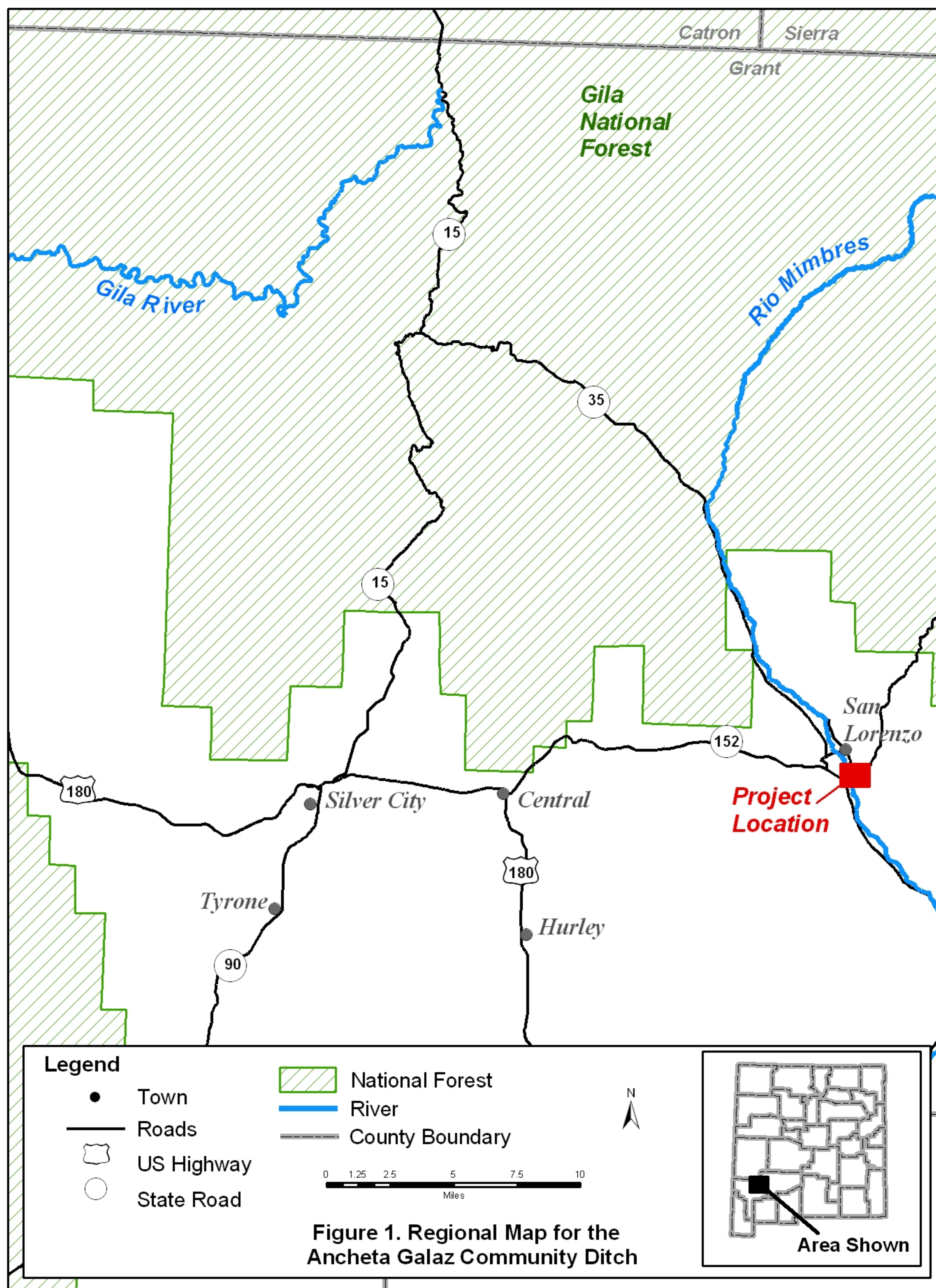
2.0 INTRODUCTION

The Corps, at the request of the New Mexico Office of the State Engineer (OSE) and Ancheta Galaz Community Ditch, is planning a project that would rehabilitate the system’s concrete alignment at a point where the acequia has been breached by flood erosion of the east bank of the Mimbres River immediately upstream from the State Route (SR) 152 bridge. This reconstruction would be accompanied by construction of bank stabilization structures along the east and west banks to prevent further erosion. Work would be conducted under the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), which authorized the Corps to conduct the restoration and rehabilitation of irrigation ditch systems and acequias in New Mexico. Under Section 1113 of the Act, Congress found that New Mexico’s acequias date from the eighteenth century and, due to their significance in the settlement and development of the western United States (U.S.), should be restored and preserved for their cultural and historic value to the region. The Secretary of the Army has been authorized and directed to undertake, without regard to economic analysis, such measures as are necessary to protect and restore New Mexico’s acequias. The proposed improvements to this acequia satisfy the intent and purpose of this legislation.

3.0 DESCRIPTION

The Ancheta Galaz Community Ditch is located in Grant County, south of the hamlet of San Lorenzo, New Mexico (**Figure 1**). The Ancheta Galaz Community Ditch obtains water from the Mimbres River, and the system as whole provides water to seven irrigators and approximately 153 acres of cultivated land (Pittman 2002). Alfalfa is the main crop produced along this acequia, with orchards as the secondary farming activity. Farm size averages 21.9 acres.

The Ancheta Galaz alignment extends approximately 0.75 mile parallel to the east side of the Mimbres River, eventually returning tailwater to the river through a desagua located at the end of the system. The Community Ditch consists of one main ditch. While there are branching laterals extending from this acequia, these are considered field laterals owned and maintained by individual landowners and are not part of the Ancheta Galaz Community Ditch as it is administratively defined. The entirety of the Ancheta Galaz Community Ditch was concrete-lined in the late 1950s and early 1960s (Pittman 2002).



The proposed project, located immediately upstream of the SR 152 bridge over the Mimbres River (**Figure 2**), would realign the ditch to avoid a collapsed segment damaged by streambank erosion. The realigned main ditch would be 255 feet long and concrete-lined, similar to the 246-foot long segment it would replace. Other proposed rehabilitation activities focus on the construction of bank stabilization along the east bank of the Mimbres River, extending approximately 400 feet upstream from the SR 152 bridge. This structure would consist of wire and rock-filled structures anchored to a double row of vertical posts, placed at intervals along the streambed, to prevent further erosion of the east bank above the bridge. An example of a similar structure, now placed along the nearby Heredia Acequia diversion structure, is shown in **Photograph 1**. The west bank would be stabilized with rock-filled wire baskets, one foot thick, for approximately 150 feet immediately upstream from the bridge.

A staging area situated east of the acequia alignment and north of the SR 152 bridge was also examined during this project. The staging area is approximately 0.6 acre in size.

4.0 CULTURE HISTORY

The project area is situated in what archaeologists have defined as the heartland of the Mimbres Culture Area. Located in the watershed of the Mimbres River basin, this region is distinguished by a succession of occupations typified, during later prehistoric times, by the appearance of Classic Mimbres black-on-white pottery. This pottery, with its fine linework and zoomorphic figures, is known throughout the world. What follows is a brief summary of the prehistory and history of this region.

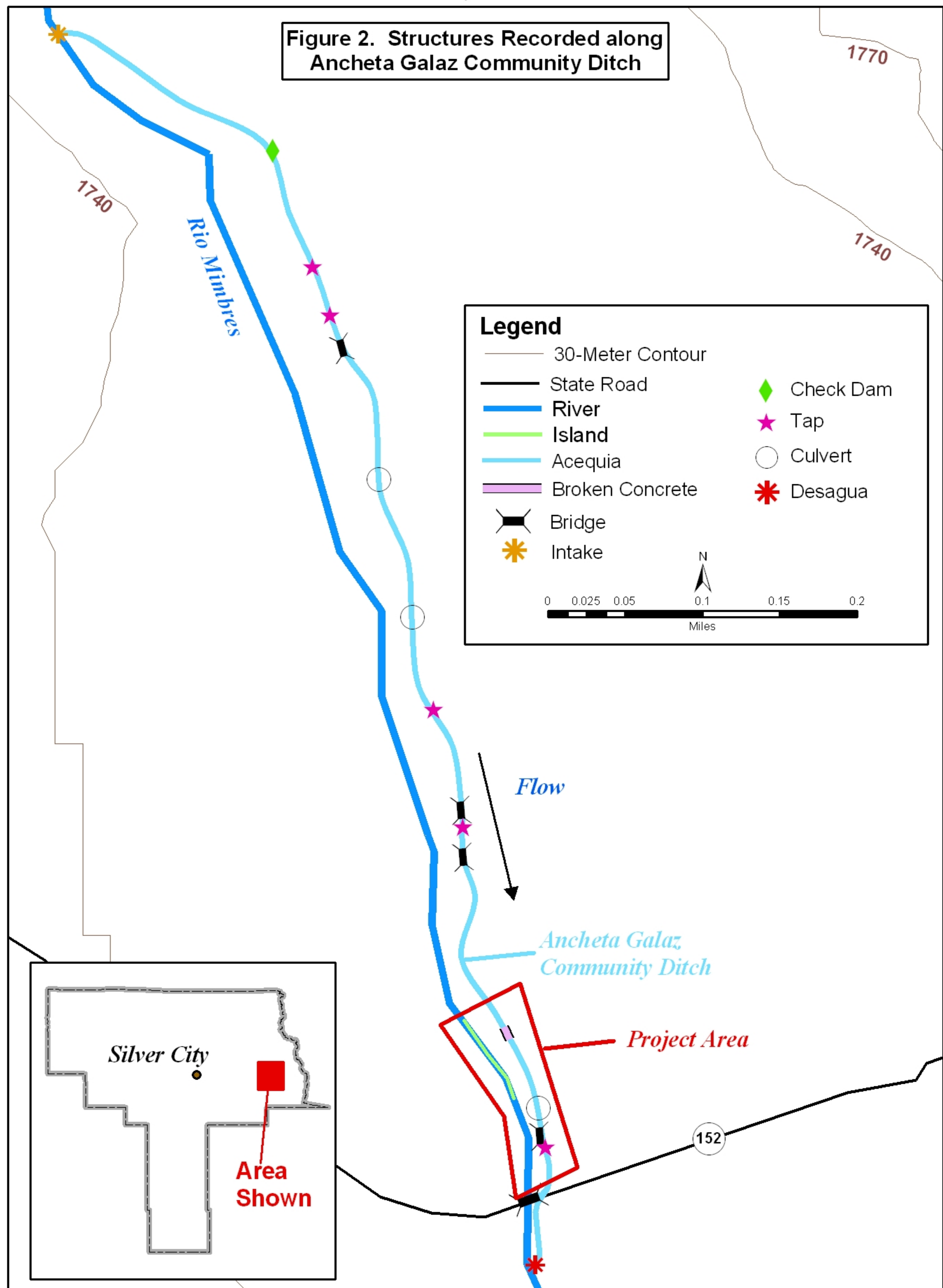
The importance of specific sites in the project area can best be understood by comparing them with the prehistory and history of sites from the surrounding area. The prehistoric occupational sequence of the Mimbres River contains six major periods including, from earliest to latest, PaleoIndian, Archaic, Formative/Early Ceramic, Early Pithouse, Late Pithouse, Classic Mimbres, and Post-Classic Mimbres periods. The historic occupational sequence begins at about 1800, following the establishment of Santa Rita del Cobre, and continues to modern times. The major characteristics of each phase are summarized below.

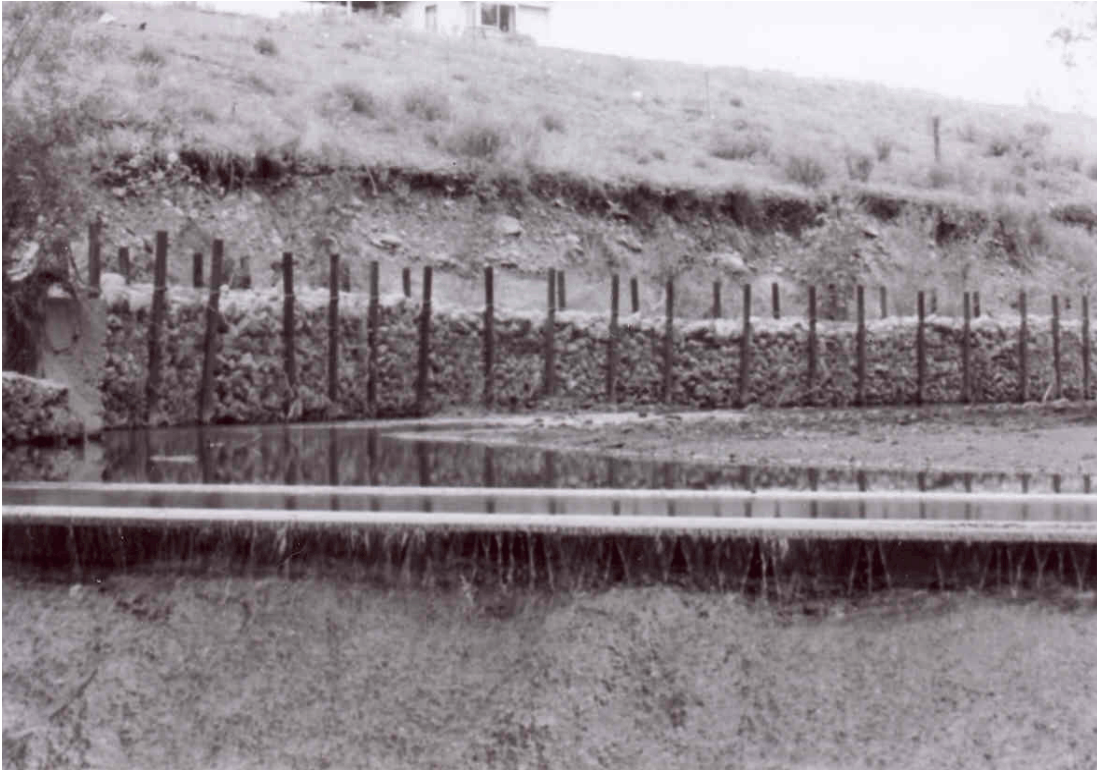
4.1 PaleoIndian Period (B.C. 10,000 to B.C. 7,000)

The PaleoIndian period represents the oldest series of occupations known in the American Southwest and, for that matter, in North America. Typically associated with the late Pleistocene period, a time characterized by global warming and a northward contraction of glaciers, PaleoIndian occupations are the closest North American parallel to an Upper Paleolithic lifeway. Two time intervals within the PaleoIndian period are indicated by the recovery of stylistically distinct Clovis and Folsom projectile points (Beckes 1977, Eidenbach 1983, Harkey 1981). Folsom points, with their distinct “flutes” extending perpendicular to the base of each point, are among the best-known artifacts from this time period.

PaleoIndian sites are usually indicated by the recovery of large lanceolate projectile points in association with extinct animals such as mastodons. Accordingly, most archaeological sites from this period are classified as “kill” sites in which numerous animals were slaughtered. In conjunction with the recovery of burins, graters, and other artifacts typically used to process hides and bone, it seems undeniable that adaptations during this period focused primarily on hunting of Pleistocene megafauna (Judge 1973).

Little is known about the PaleoIndian period in the project area. James Fitting (Lekson 1989:1,14) notes that PaleoIndian sites are not found with any frequency in the region and suggests that they perhaps were destroyed as a result of widespread erosion. It seems unlikely that the environments present in the project area were not used by these people at some time or another. While the reason for the scarcity of PaleoIndian sites is not clear, a search of Archaeological Records Management Section (ARMS) files found no PaleoIndian sites in the immediate project area.





Photograph 1. Example of Rock-Filled Similar Wire and Post Structure to Stabilize Bank Erosion

4.2 Archaic Period (7,000 B.C. to A.D. 200)

The Archaic Period is perhaps one of the most persistent adaptations in Southwestern prehistory. Typified by hunting-and-gathering activities, there is evidence to suggest that this kind of adaptation may have lasted upwards of 7,200 years in different parts of New Mexico. Given the persistence of this way of life, it is not surprising that, unlike the PaleoIndian period, thousands of Archaic sites have been reported across southern New Mexico.

Archaeologists believe that environmental change was the primary factor contributing to a shift away from reliance on large animals and more toward the use of smaller game (e.g., deer) and plant resources. With the gradual warming that signals the end of the Pleistocene, and the eventual extinction of cold-weather Pleistocene animals, early hunter-and-gatherers found themselves had little choice but to diversify their diet. It is this diversification, and more precisely the increased importance of gathering, that defines the boundary between PaleoIndian and Archaic adaptations.

With diversification in subsistence practices came substantial changes in the artifacts found at Archaic sites. Chipped stone tools are far less specialized than in PaleoIndian times and consequently exhibit far more stylistic variation. For example, PaleoIndian Folsom projectile points have basically the same characteristics regardless of where they are found in North America. In contrast, projectile points from Archaic times are highly diversified and, more importantly, the styles change from region to region within the same time intervals.

At the same time, archaeologists have become more cautious in their examination of Archaic sites. For many years, the designation of “Archaic” was used as a catchall category for any site with multiple hearths, an absence of pottery, and (usually) lack of structures. As inquiries expanded, however, it became apparent that these characteristics were similar to, if not the same as, the characteristics of historic Apache sites as described by early explorers. A review of ARMS files revealed no evidence of Archaic sites in the immediate project area.

4.3 Ceramic (Formative) Period (A.D. 200 to A.D. 1500): General Trends

The Ceramic or Formative Period extends from A.D. 200 to A.D. 1500 and contains a number of distinct phases. Prior to sophisticated dating techniques, the time period encompassed by the Formative Period was based on ceramic cross-dating by the Cosgrove’s (1932), Haury (1936), and the Mimbres Foundation (Anyon and LeBlanc 1984:21).

Four separate phases have been identified in the 1300 year time span of the Formative Period. These phases include the Early Pithouse (A.D. 200 to A.D. 550), Late Pithouse (A.D. 550 to A.D. 1000), Classic Mimbres (A.D. 1000 to A.D. 1150), and Postclassic Mimbres (A.D. 1175 to A.D. 1450). The Late Pithouse phase has been further partitioned into three separate intervals. These include the Georgetown phase (A.D. 500 to A.D. 624), the San Francisco phase (A.D. 624 to A.D. 850), and, finally, the Three Circle phase (A.D. 850 to A.D. 1000).

There were many changes in subsistence strategies and settlement patterns among peoples residing in the Project area during the Formative Period. There was a gradual shift away from highly mobile, hunter-gatherer adaptations to adaptations that emphasized a combination of hunting-and-gathering and reliance on domesticated crops. Commensurate with this change in subsistence practices was a decline in group mobility and a shift toward more permanent habitations.

In addition to the appearance of more permanent sites, the location of habitation sites also changed dramatically from what has been observed among earlier Archaic occupations. Specifically, in the Early Pithouse period, villages tend to be located primarily on hill tops and mesas. As agricultural pursuits assumed a more prominent role in the adaptations of these prehistoric peoples, sites tend to shift into mountain transition zones. This is especially noticeable in the Mimbres Classic period and there is a pronounced increase in the amount of land used for farming. Immediately prior to Spanish contact, during the Black Mountain phase of the Postclassic Period, available evidence suggests that settlements tended to occur more in desert valleys, while the mesa areas were all but abandoned.

Architectural styles and settlement layout undergo changes as well. In the earliest phase of the Formative Period, settlements typically consist of small numbers of small, round pithouses. Such small settlements are consistently groups that are small in size, largely horticultural, and still relatively mobile. By the later phases of the Formative Period, settlements consist of large multi-room pueblos indicating clustered or nucleated populations. The Mimbres Foundation, during their investigations at the Galaz Site, found evidence for specialization in room size. According to Anyon and LeBlanc (1984:312) rooms measuring under 8 square meters (m^2) (classified as small) were for storage, rooms measuring between 8 m^2 and 26 m^2 (classified as medium) were for habitation, while rooms over 26 m^2 (classified as large) were determined to be for communal functions (Nelson and LeBlanc 1986:1). It is frequently the case that such large villages are surrounded by outlying smaller settlements that probably were not occupied on a year-round basis. Unlike large pueblo sites, these outlying pueblos do not show the range of variation of room sizes indicative of specialized functions.

Highly varied burial practices have been identified during the Formative Period. Among the burial modes documented at various sites are cremations, extended burials, and flexed burials. Equally important, the locations of burials changes throughout the Formative Period. In their analyses of more than 1,000 burials from the Galaz ruin, the Mimbres Foundation found that sub-floor burials were quite rare during the Georgetown and San Francisco phases. Grave goods, usually indicative of rank and status distinctions

between individuals, were relatively uncommon during these two phases and there were few differences in the quantity or quality of grave goods between burials. Placed within room blocks, sub-floor burials from these two phases contained ceramic vessels near the knees and feet of the interred body. It is largely on this basis that archaeologists have concluded that there were few differences in rank or status of these peoples.

During the Three Circle phase, sub-floor burials become the most common form of burial. Some burials had Style I bowl fragments scattered throughout the grave. It is not until Style II that “killed” bowls, those with a hole deliberately punched in the center and inverted over the skull, appear in burials.

Finally, extramural burials, in which individuals are buried outside of dwelling areas, tend to occur most often during the Classic and Post-Classic phases. Extramural burials first appear in the Three Circle phase, but constituted only 25 percent of all burials found from this time period at Galaz.

4.4 Historic Period: General Trends

Historical documents indicate that Apache Indians inhabited the project area shortly after the Mimbres culture seems to have disappeared. However, there is little or no evidence of the protohistoric nature of the Apaches based on linguistic affiliations with Uto-Aztecan languages. Apachean speakers seem to have originated somewhere in the upper Great Plains. These groups were gradually displaced further south and west across the Great Plains, perhaps beginning as early as the 1300s (Spicer 1962:14). Athabaskan-speaking groups, which includes Apaches, arrived in eastern New Mexico sometime around 1541 (Schroeder 1974a:iv). This progressive displacement of tribes continued throughout the 1500s and early 1600s, with tribal boundaries shifting in response to both Spanish settlements and incursions by other Native American groups. By the 1600s, Apache-speaking tribes were well established in southwestern New Mexico. Their presence in what was termed the “Apache Corridor,” extending from southwest of Santa Fe toward Sonora, Mexico, was a major factor inhibiting Spanish settlements in this part of New Mexico (Spicer 1962:152).

Throughout the literature the Indians of the region are called by many names: Gileño, Mimbrenño, Mogollon, Mimbres, Gila, Warm Springs, Copper Mine, Chiricahua, Querechos, and Mescalero. The earliest records of travelers in the region suggest that much of this territory was unoccupied. While not systematic, the following accounts underscore the absence of American Indians over much of southwestern New Mexico. The Coronado and Marcos expeditions crossed the northern portion of the project area in 1540 and 1539, respectively. Chroniclers of these expeditions specifically mention large uninhabited areas taking 13 to 15 days to cross. Such findings gave rise to the term *despoblado*, meaning deserted or depopulated, that was frequently applied too much of the region. The Ibarra expedition of 1564 to 1565 explored the southern portion of the study area as far southwest as Sonora and did not note any indigenous groups in the region (Schroeder 1974a: 62,127).

Benavides, in recording his travels from 1626 to 1629, is the first to report American Indians in the project area:

Starting then from this province the Gila Apaches which extends for more than fifty leagues along the frontier of the pueblos of New Mexico toward the west, we reached the magnificent province and tribe of the Navajo Apaches [sic]. . . Thus, all those fifty leagues from the Xila (Gila) up to this Navajo nation are settled with rancherías, and the territory of the latter extends for another fifty leagues of frontiers (quoted in Schroeder 1974a:172).

In the 1750s, the two primary groups inhabiting the project area were the Mimbres Apaches and the Gila Apaches. These groups were so named because of their close association with the headwaters of their respective river valleys. Despite the fact they were given different names by the Spanish, these Apachean bands shared a number of common characteristics. The successive displacements noted above no doubt had dramatic impacts on the overall character of Gileño and Mimbrenño bands by the time of initial

Spanish contact. They were largely mobile, especially after obtaining horses from the Spanish, and rarely occupied permanent camps. Instead, they occupied *rancherías* whose location shifted from one season to another, and from year to year. All groups relied primarily on hunting-and-gathering, although there is some evidence of limited use of domesticated crops (corn, chili, and pumpkins). The Apache also maintained trade networks with the Pueblo Indians on the Rio Grande, the Mescalero on the east side of the Rio Grande, and the Navajo and Zuni Indians on the north. Among the most important items obtained through trade were buffalo skins and brightly-colored blankets (Schroeder 1974b:63).

The late 1700s saw a series of military campaigns throughout southern New Mexico as far north as the Gila River. The impact of these campaigns was minimal, at least in terms of numbers of Apaches captured and killed. Yet, by 1790, many Apache bands began to return to Spanish villages in Sonora and Chihuahua (Griffen 1988a:63). This relatively peaceful period was not without difficulties. Some Apache tribes resisted removal to Spanish presidios and maintained *rancherías* throughout the Mimbres, Mogollon and Florida mountains (Griffen 1988b:76). The Spanish policy, somewhat innovative for its time, bought a short peace that came to an end in the 1820s. With the outbreak of the Mexican Revolution and for years thereafter, subsidies for Apaches were seldom, if ever, delivered. Lacking any motivation to abide by their agreement, the Apaches again reverted to their old practice of raiding Spanish settlements. This situation was exacerbated after Independence since several Spanish garrisons along the northern frontier were abandoned. Without replacement troops from the newly-founded Mexican government, the stabilizing influence of the presidios simply dissipated, thereby opening the region once again to Apache raiding (Schroeder 1974b:124-125).

The American Period begins with the acquisition of land described in the Treaty of Guadalupe Hidalgo (1848) and with the Gadsden Purchase (1854). These two events formally brought the project area under American jurisdiction. With the arrival of American military forces, Manifest Destiny finally reached the northern frontier of Mexico. The Office of Indian Affairs, operating with the Department of War, was established to help resolve conflicts between settlers and American Indians (Couchman 1990:43-44). Consistent with the previous Spanish and Mexican experiences, it rapidly became clear that these newly acquired lands would never be developed without peace from the Apaches. The first territorial governor, James S. Calhoun, served as General Indian Agent from 1848 to 1851 and clearly anticipated the potential for long term warfare throughout the region if the Indians were not placed on reservations (Bancroft 1889:662). In his 1849 annual report to Washington, Calhoun observed that:

Expend your million now, if necessary, that you may avoid the expenditure of millions hereafter. The Indian should be confined to certain limits, and made to realize the strength of the U.S. If allowed to roam, they will never keep their treaty promises. Agencies should be established at . . . and at Socorro to look after Apaches and Comanches (Bancroft 1889:460-461).

In a move reminiscent of earlier Spanish and Mexican policies, the Americans proposed that food subsidies be provided to American Indians. William C. Lane, Calhoun's successor as Indian Agent, supported the idea that American Indians be subsidized. He believed the way to avoid a full scale war and to stop them from raiding was to provide them with food, clothing and materials with which they could earn their living (Bancroft 1889:664). In a move combining elements of both strategies, the Americans decided to establish military outposts to protect settlers, while simultaneously trying to persuade the Apaches to settle on nearby reservations. The U.S. Government intended these forts as a message to the American Indians: if peace were not established, military installations would be built in the middle of all tribal lands to encourage peace. If peace was not forthcoming, the U.S. made it clear that it would obtain peace through more forceful means. Located near Silver City were Fort Webster (1851) near the Santa Rita Copper Mines, Fort Floyd (1857) near Cliff, Fort McLain (aka McLane – 1860) near Faywood, Fort West (1862) also near Cliff, Fort Cummings (1863) near Deming, and Fort Bayard (1866) in Bayard.

Although mining began in the early 1800s at Santa Rita del Cobre, the expansion of mining across the region languished until 1891 due simply to transportation difficulties; in short, it was almost impossible to get equipment and supplies into the region and equally difficult to get ore out. Local smelters, most constructed of adobe, were used to process ores until completion of the Silver City, Deming, and Pacific Railroad in 1883 (Entwhistle 1944:34, Howard 1967:236). This railroad, which operated between 1884 to 1899, allowed transshipment of machinery for large smelters so that, by 1904, two high-capacity smelters operated in Silver City (Anderson 1957:74-75, Entwhistle 1938:70-72, Howard 1967:236). Similarly, completion of the Atchison, Topeka, & Santa Fe Railroad into Silver City in 1891 also contributed to an expansion of mining throughout Grant County (Lindgren et al. 1910:306).

Irrigation in the Mimbres River basin began with the efforts of Dr. Michael Steck, New Mexico Indian Agent, to establish a reservation for the Mimbrenño and Gileño Apaches near San Lorenzo in 1851 (Ackerly 1997). Political intrigue, combined with minimal farming success, caused the endeavor to be abandoned in 1853. Irrigation systems eventually appeared throughout the valley in the years immediately following the Civil War.

The Ancheta Galaz Community Ditch was constructed in 1870, largely to relieve competing demands for water from farmers located on the earlier (1869) San Lorenzo East acequia (Berry and Berry 1984:17). Early cultivation focused on wheat, corn, beans, and vegetables (Berry and Berry 1984:18). Much of this food was sold to miners at the then-burgeoning mining town of Piños Altos, as well as to the early residents of Silver City. This crop production pattern persisted into the early 1930s, only to be replaced largely by alfalfa production by the 1970s (Ackerly et al. 1993:274-280).

Systematic comparisons of a series of hydrographic surveys completed by the OSE, as well as conversations with Mr. Robert Pittman (2002), president of the ditch group, indicate that the Ancheta Galaz Community Ditch has been successively modified many times over the past 132 years (OSE 1932, 1970). Specifically, the locations of diversion dams have shifted over time, largely in response to episodes of flood-induced channel change, and portions of the Ancheta Galaz Community Ditch alignment have also been altered over the years (Ackerly et al. 1993). Only within the past 50 years with the use of concrete lining has the acequia achieved a degree of locational stability previously unknown.

5.0 METHODOLOGY AND SURVEY RESULTS

5.1 Methodology

The cultural resources survey of this proposed replacement portion of the acequia was preceded by a check of site files at ARMS in Santa Fe. Five previously recorded sites, including LA5799, LA5800, LA19041, LA65895, and LA73963 are situated 0.5 mile from the centerline of the Ancheta Galaz Community Ditch.

Of these sites, LA5799 and LA19041 represent prehistoric occupations ranging in age from A.D. 1000 to A.D. 1400. LA5800 contains remains consistent with occupations dating between A.D. 200 to A.D. 1400. All these prehistoric sites exhibit surface architecture and relatively dense associated trash deposits consistent with protracted occupations. LA65895 and LA73963 are both related to historic occupations of the Mimbres Valley, dating from the late nineteenth through the mid-twentieth centuries. The Ancheta Galaz Community Ditch does not intersect any of these known sites.

The Class III inventory consisted of an intensive pedestrian survey of the construction and staging areas (4.55 acres) for proposed repairs to the Ancheta Galaz Community Ditch, as well as an examination of the eroded bank where proposed stabilization/erosion control structures would be constructed. Additional documentation of the acequia included walking the ditch and recording the locations of water control structures (e.g., culverts, check structures, taps), as well as an on-the-ground inspection of the Ancheta Galaz as it extends downstream from the diversion dam (**Photograph 2**).



Photograph 2. View of Diversion Dam and Intake of the Ancheta Galaz Community Ditch

Table 1 summarizes coordinates for the centerline of the entire acequia. Water was not flowing through the acequia at the time of this inventory, so that detailed inspections of the sides, bottom, and margins of the ditch were possible. Representative examples of water control structures and the eroded bank of the Mimbres River are presented in **Photographs 3 to 6**.

Table 1. Locations of Water Control Structure in Ancheta Galaz Community Ditch

UTM ¹		Structures	UTM		Structures
Easting	Northing		Easting	Northing	
226683	3632774	Diversion Dam	227033	3631852	Bridge
226696	3632778	Intake	227034	3631849	Tap
226891	3632596	Check Dam	227035	3631836	Bridge
226923	3632458	Tap	227046	3631733	Canal Break North
226929	3632397	Tap	227042	3631720	Canal Break South
226945	3632355	Bridge	227036	3631687	Culvert
226956	3632250	Culvert	227056	3631603	Bridges
226971	3632080	Culvert	227058	3631596	Tap
227003	3631940	Tap	227057	3631562	Desagua

Notes: (1) UTM = Universal Transverse Mercator.

Coordinates in UTM, Zone 13, North American Datum 1927, collected by Global Positioning System.



Photograph 3. View of Collapsed Portion of the Ancheta Galaz Community Ditch



Photograph 4. Typical Cross-Section of the Ancheta Galaz Community Ditch



Photograph 5. View Looking Upstream Along East Bank to be Stabilized



**Photograph 6. Detail of Eroded Bank Showing Damaged Part of the
Ancheta Galaz Community Ditch**

5.2 Survey Results

No prehistoric or historic archaeological sites were found within or immediately adjacent to the Ancheta Galaz Community Ditch right-of-way. Examination of the eroded bank of the Mimbres River in the area proposed for bank stabilization did not reveal any evidence of subsurface archaeological resources. There was no surface evidence of archaeological remains in the proposed staging area situated east of the acequia alignment and north of the SR 152 bridge. None of the five previously recorded archaeological sites discussed above would be affected by the proposed project.

6.0 CONCLUSIONS

The Ancheta Galaz Community Ditch is potentially eligible for inclusion on the National Register of Historic Places under Criteria a and d of 26 CFR 60.4. The ditch was originally constructed in 1870 and early cultivation focused on wheat, corn, beans, and vegetables.

Hydrographic surveys, as well as conversations with Mr. Robert Pittman (2002), indicate that the Ancheta Galaz Community Ditch has been successively modified many times over the past 132 years. The locations of diversion dams have shifted over time, largely in response to episodes of flood-induced channel change. Portions of the ditch alignment have also been altered over the years. Only within the past 50 years with the use of concrete lining has the 0.75 mile Ancheta Galaz Community Ditch achieved a high degree of locational stability.

Today, the Ancheta Galaz Community Ditch obtains water from the Rio Mimbres and the system as whole provides water to seven irrigators and approximately 153 acres of cultivated land (Pittman 2002). Most irrigated lands focus on alfalfa or orchards. Despite changes in the location and character of this ditch over the years, it remains pivotal to the economy and cultural characteristics of communities in the Rio Mimbres.

The proposed realignment and concrete lining of 255 feet of the main Ancheta Galaz Community Ditch and stabilization of the banks of the Mimbres River adjacent to the ditch would have no adverse effect on the acequia's eligibility as a potential historic property. Based on these findings, an archaeological clearance is recommended for this proposed rehabilitation project.

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